IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	PEDZIWIATR, JOSEPH ET AL.	EXAMINER:	IQBAL, KHAWAR
SERIAL NO.:	10/043,797	GROUP:	2686
FILED:	JANUARY 11, 2001	CASE NO.:	CE08185R
TITLED:	HIGH INTEGRITY RADIO ACCESS NETWORK CLIENT REALLOCATION IN A WIRELESS COMMUNICATION NETWORK		

Motorola, Inc.
Corporate Offices
1303 E. Algonquin Road
Schaumburg, IL 60196
July 5, 2005

Declaration Under 37 CFR §1.131

1. We, Joseph Pedziwiatr, Paul Steinberg, William S. Pierce, Richard James Malcolm, Daniel Francis Tell and Brian Jack Moore, are inventors of the present application and hereby make this declaration.

2. This declaration establishes the completion of the invention in this application in the United States, at a date prior to June 29, 2001 that is the effective date of United States Patent Application Publication No. 2003/0003919 A1 to Beming et al., which was cited by the Examiner.

3. The claimed subject matter of this patent application was the subject of a written disclosure prepared after conception and wherein the written disclosure was submitted as a Disclosure for Patent Committee to the assignee, Motorola, Inc. for the purpose of documenting, considering and maintaining invention disclosures. The Disclosure for Patent Committee is attached as Exhibit A.

4. The conception date of May 21, 1999, which is the earliest verifiable date an individual who is a non-innovator witnessed the claimed subject matter, is prior to June 29, 2001.

5. On or about June 24, 1999, Motorola, Inc. decided to pursue patent protection on the written disclosure previously submitted, and that thereafter, in due course, a patent application was prepared and filed in the United States Patent Office on January 11, 2001.

6. Prior to June 29, 2001 to January 11, 2001, we exercised due diligence to prepare and file the pending patent application. During this time period, we worked toward preparing the pending patent application for filing with the United States Patent and Trademark Office.

7. All of the above statements made of our own knowledge are true and all statement made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of this application or any patent issuing thereon.

Joseph Pedziwiatr	Date
Paul Steinberg	Date
William S. Pierce William S. Pierce	July 5, 2005 Date
Richard James Malcolm	Date
Daniel Francis Tell	Date
Brian Jack Moore	Date

#4

MOTOROLA INC.
Cellular Infrastructure Group

Motorola Confidential Proprietary

Inventor(s) will not fill in

Operation

DISCLOSURE NO. CE08185R DATE 4/27/99

Patent Committee Action

DISCLOSURE FOR PATENT COMMITTEE

SUBMITTED PURSUANT TO EMPLOYMENT AGREEMENT

FOR INSTRUCTIONS FOR COMPLETION REFER TO DISCLOSURE INSTRUCTION PROCEDURE

Inventor(s) Name(s)
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Pierce, Bill
Malcolm, Rich
Tell, Dan
Moore, Brian
Spear, Steve
Shrew, John

Inventor must fill in items 1 thru 13. Items 2 to 5 may require extra sheets.
BE SURE that all attachments are signed and dated by both the inventor(s) and witnesses.

1. Name of the invention. (Limit to ten word.)
Seamless High Integrity Radio Access Client Handoff in a Wireless Network

2. State the problem(s) solved by the invention.
See attached.

3. Describe the invention, including its operation, purpose and environment. (Use separate sheets as required).
See attached.

4. List the closest known technology (attach article, patent, catalog sheet or other documentation).
See attached.

5. Improvement(s) over known technology.
See attached.

6. What new elements (e.g. components, circuits, process steps) or combination of known elements or software algorithm produced the improvement?
See attached.

7. What are the potential applications for use of this invention?
Anyone deploying CDMA systems (Lucent, LG, Samsung, Nortel, etc.)

8. Conception date? ____________ (Attach earliest log sheets, drawings, etc., to support dates).

9. To whom did you first disclose this invention? Name: ________________ Date: __________

10. Date the device was first built and tested. ________
Present location of the device? Not currently implemented.

called Joe

DETERMINATION OF LEGAL INVENTORSHIP WILL BE BY THE PATENT DEPARTMENT.

Inventor's signature (IMPORTANT -- YOU MUST USE YOUR FULL NAME) -- NO INITIALS

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Witness signatures (TWO WITNESSES ARE REQUIRED). Witness must sign and date this form and all attachments.
THE WITNESSES IN SIGNING THIS FORM ATTEST TO THE FACT THAT THEY UNDERSTAND THE INVENTION.

14. Witness Name:(Type) LARRY D. SVEC Signature [signature] Date 20 May 99 Phone 847 632 5259

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Items 16 thru 24 are to be filled in by the ENGINEERING/PRODUCT MANAGER or above.
THE MANAGER IN SIGNING THIS FORM ATTESTS TO THE FACT THAT HE UNDERSTANDS THE INVENTION.

16. What product will this invention be used in? (No code names -- use brief description if necessary)
Aerolon applications.

17. When (was) (will) the first offer for sale of a product incorporating this invention (be) made?
Date: ____________

18. When is the estimated shipping date?

19. When (was) (will) the first disclosure outside of Motorola (be) made? How and to whom? Nondisclosure agreement signed? State title and date of publication, if any.

20. What is the market for products incorporating this invention? Be specific and quantitative.
GSM/CDMA/UMTS Cellular Systems, GSM/CDMA/UMTS EnterpriseWireless Systems
GSM/CDMA/UMTS Wireless Local Loop Systems

21. Who are the potential competitors? What is the possibility this invention will be used by competitors? Which ones?
Lucent, Samsung, LG, Nortel, Cisco, Ericcson, Nokia

22. Did this invention result from work on a development Contract? (YES) (NO) Contract No.____________
Who was the contracting party?

23. Discuss the business impact that this invention will have on Motorola. Be specific and quantitative.
This invention provides a means to seamlessly move the bearer and control client functions from one Radio Access Network to another. The method uses bridging functions within the Core and RAN networks allowing for simultaneous high integrity connections between the existing a future RAN components through the move operation.

24. Manager's Name (Type) ____ | Signature ____ | Date ____ | Dept. No. ____ | Phone ____

DETERMINATION OF LEGAL INVENTORSHIP WILL BE MADE BY THE PATENT DEPARTMENT.

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Page 2--Disclosure No.________ Motorola Confidential Proprietary Upon Completion

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Bill Payne	BC279	5-5155	510-46-2151

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Disclosure for Patent Committee

1. Name of the invention

Seamless High Integrity Radio Access Client Handoff in a Wireless Network

2. State the problem(s) solved by the invention

When a Mobile Termination device accesses the network requesting a desired service, a set of resources and path connections (Control and Bearer) are established within the Core and RAN network to support the requested service. This initial call configuration is assumed to be the optimum call configuration, given the state of the networks at the time of access. But, the dynamics of the RF environment along the mobility of the Mobile Terminating device, this initial call configuration may quickly become sub-optimum.

Functions within the RAN exist to optimize the RF paths. These RF path optimizations result in the establishment or removal of RAN based resources along with their associated control and bearer paths. As the Mobile Terminating device moves throughout the system, the crossing of RAN and CORE boundaries is inevitable. RAN boundary crossings are addressed within the Aerolon network via RAN to RAN interfaces. These interfaces allow Mobile Termination Device services to be provides across the boundaries. In general these interfaces allow for the allocation of BTS and RF resources along with a path for control messaging and bearer traffic delivery. But the support of calls across these interfaces may become sub-optimum over time. The control and bearer traffic paths may be over extended thus introducing unacceptable control latency and bearer traffic delays (including differential delays).

Typically, Radio Access Call Control and Bearer Path Management is centralized at a point within the RAN, referred to in general terms further as the RAN Session Client (RSC). (In particular to CDMA (Wide Band CDMA) the Selector Distribution Unit (SDU) and Radio Network Control Servers (RNCS) are instantiations of an RSC. Critical in maintaining an optimum call configuration is the location of the RSC. The RSC placement is critical, since the RSC serves as the termination point for the Core and BTS Bearer Path along with RAN Call Control. Locating the RSC to minimize bearer traffic delays and control latency is a crucial aspect of an optimum call configuration.

It is therefore beneficial from a Call Quality perspective to transfer the RSC from one physical point to another within the RAN Network.

Moving the physical location of the RSC is currently supported within some networks via intrusive manners. These procedure generally break and re-establish both Core and Radio connections, such as CDMA Hard Handoff. This not only impacts the quality of a given call but requires undesired interaction between the Core Network and MS on RAN boundary limitations. In addition, any modification to the Core and MS connections brings the potential for a failed connection.

Inventor ____ Date 5/10/99 Witness ____ Date 20 May 99
Inventor ____ Date 5-20-99 Witness ____ Date 20 May 99
Inventor ____ Date 5/20/99

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5/20/99

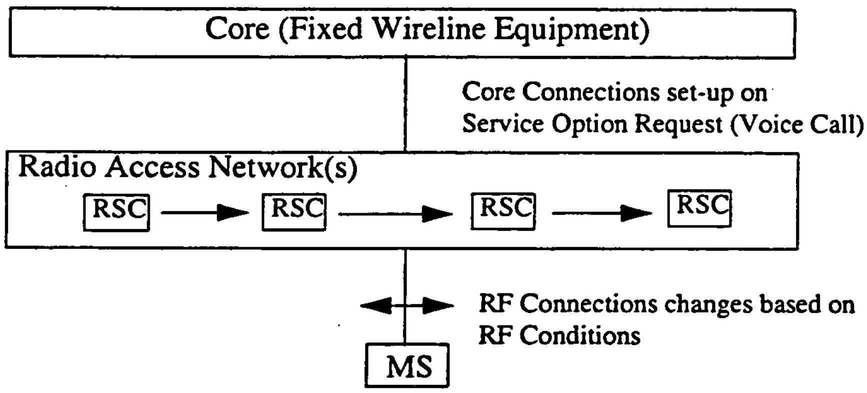
5/20/99
5/20/99 Joseph Radzewski 5/21/99

A method needs to be provided which provides a seamless RSC reallocation and which preserves the integrity of the call and connects.

3. Describe the invention, including its operation, purpose and environment.

The following invention specifies a method of moving the RSC within and across RANs in a seamless manner with high integrity. Figure 1, "Seamless RSC Handoff Illustration," on page 2 depicts the objective of this invention. The figure highlights the Fixed Equipment in the Core network and MS's connections unaffected by RSC reallocation within the Radio Access Network(s).

FIGURE 1. Seamless RSC Handoff Illustration



In order provide for a seamless RSC handoff, two parallel paths from the BTS(s) and Core network are created. These connections involve two RSCs with the parallel paths supported via a RANS and Core "Y" bridging function. The "Y" bridging functions serve to provide for un-interrupted Bearer and Control for a given call session through an RSC handoff.

Figure 2, "System Bridging Functionality," on page 3 illustrates a Seamless High Integrity RSC handoff. The execution of such a procedure required the introduction of multiple bridging functions. The first bridging function, identified as the Core "Y" (a.k.a., Relay Client in Aerolon) provides a fixed termination point for fixed core based equipment (e.g., Circuit Gateway). Typically, these paths are formed at initial system access of the MSs. The Core "Y" provides bridging functions between the RSCs during the transitioning process. Further, the bridging function will allow for the integrity of the connection between the Core and new RSC prior to the bearer and control handoff within the RSC.

A RAN "Y" function is also required to shield the MS from the RSC transition. This RAN "Y" function supports the bridging and selection of control and bearer traffic from multiple RSCs. As with the Core "Y" functionality, the bridging function allows for the integrity check of the connections between the new RSC and BTS prior to the bearer and control handoff within the RSC. Typically, the multiple RAN "Y" connections will be established, since multiple BTSs are involved in a given call (CDMA Soft Handoff).

Inventor ____ Date 5/16/99 Witness ____ Date 20-May-99
Inventor ____ Date 5-2..-99 Witness ____ Date 20 May 99
Inventor ____ Date 5/20/99
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5/20/99 5/21/99
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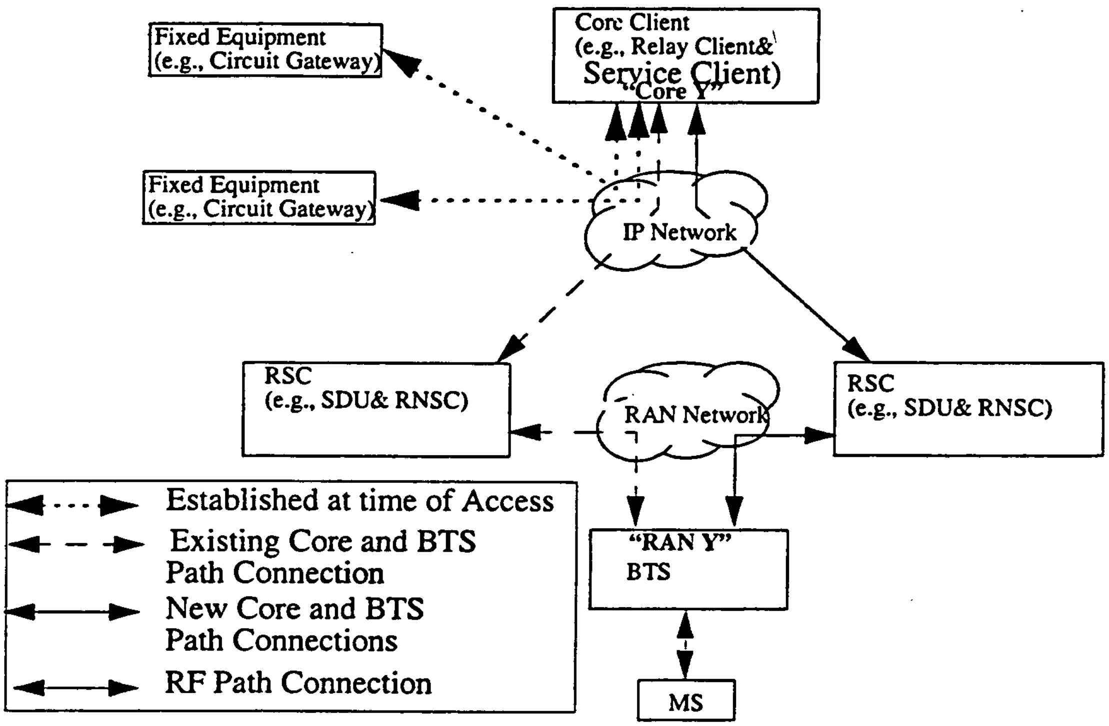
In most cases (e.g., CDMA), handing off of the RSCs involved the preservation of critical data of the Core and MSs. As an example, in a CDMA RSC handoff, the State of the MSs RF Layer 2 State information must be preserved. The relaying of this information between the two RSCs along with the coordination of the handoff would occur via either the Core "Y" or RAN "Y" function.

When all required information is obtained by the new RSC and Core and BTS paths are validated, the new RSC will take-over the control and bearer processing for the call. The old RSC connection will remain providing a graceful fallback in the case of a RSC handoff failure.

FIGURE 2. System Bridging Functionality



The following set of illustrations depict the "Seamless High Integrity Radio Access Client Handoff" in the context of CDMA.

Figure 3, "Intra-Core Streamline T=0," on page 5 illustrates a CDMA Call involved in an Inter-RAN soft handoff. CORE-1 and RAN-1 support the termination of the Core End-Points for a given Voice Call (Note multiple Core end-point may be involved). The Core network supports the Relay Client and the Service Client. Within RAN-1, the RNCS-1-1 supports the call control along with the selection function. The BTSs involved in the call are not contained within RAN-1 but are supported via bearer and control backhaul through the Inter-Vendor Soft Handoff (IV-SHO) inter-connect. At this time, a SDU/RNCS handoff (RSC Handoff) is desired.

Figure 4, "Intra-Core Streamline T=1-Establish RAN Connections," on page 6 illustrates the establishment of the SDU to BTS connection. An SDU is assigned in RAN-2 along with the BTS

Inventor ________ Date 5/26/99 Witness ________ Date 20-May-99
Inventor ________ Date 5-26-99 Witness ________ Date 20 May 99
Inventor ________ Date 5/26/99
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5/26/99 5/21/99

connections to the current serving BTSs. This function requires the RAN "Y" in the BTS. Continuation of the procedure will not occur until the new SDU to BTS(s) path integrity is assured. RAN to RAN control communications are used to initiate and coordinate the new RAN configuration.

Figure 5, "Intra-Core Streamline T=2-Establish Core Connections," on page 7 illustrates the establishment of the Core Network. An interaction will take place between the Core networks to establish a Path to the new SDU. The Relay Client establishes a Core "Y" bridging functions allowing for the new SDU to verify its path connection integrity with the Relay Client. Continuation of the procedure will not occur until the new SDU to Relay Client path integrity is assured. At this time, the Core "Y" and RAN "Y" connections are established and the handing off of control and bearer management can be performed.

Figure 6, "Intra-Core Streamline T=3-Execute Handoffs," on page 8 illustrates the interaction between the RANs to obtain control information. It is expected to minimize latency that the required call data would be exchanged via the bearer path. The used of either the Core "Y" or RAN "Y" provides a channel between the two SDUs for control data exchange. Once the required data is obtained by the new SDU, the new SDU will take control of the call. The old SDU and its associated connections will remain as a fallback configuration.

Figure 7, "Intra-Core Streamline T=4-Tear-Down," on page 9 illustrates the teardown of the initial connections. This would be performed on the successful completion of the SDU handoff.

Inventor ______ Date 5/20/99 Witness ______ Date 20-May-99

Inventor ______ Date 5-20-99 Witness ______ Date 20 May 99

Inventor ______ Date 5/20/99

5/21/99

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5/20/99 5/21/99

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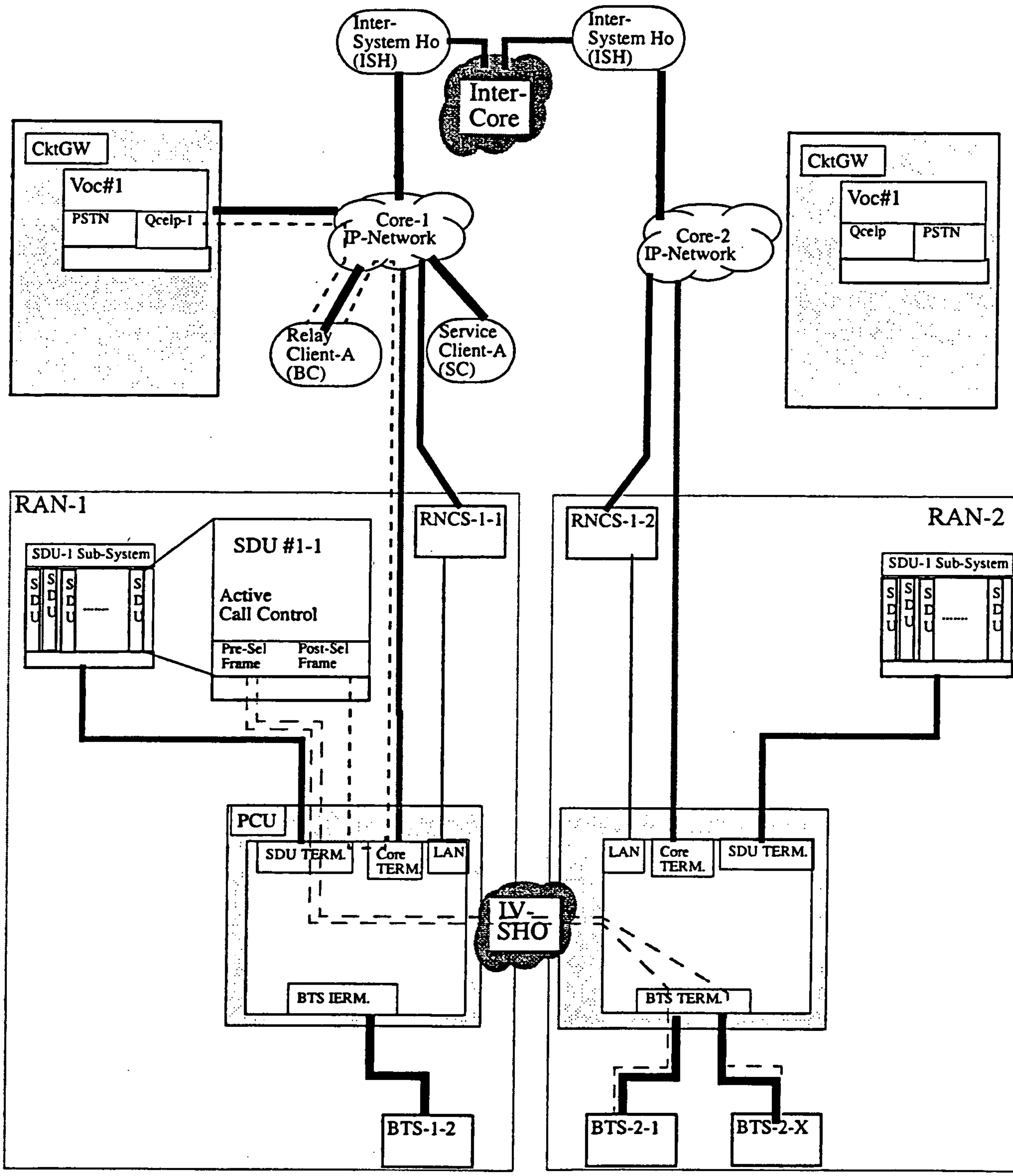
FIGURE 3. Intra-Core Streamline T=0



Inventor [signature] Date 5/20/99 Witness [signature] Date 20-May-99

Inventor [signature] Date 5-20-99 Witness [signature] Date 20 May 99

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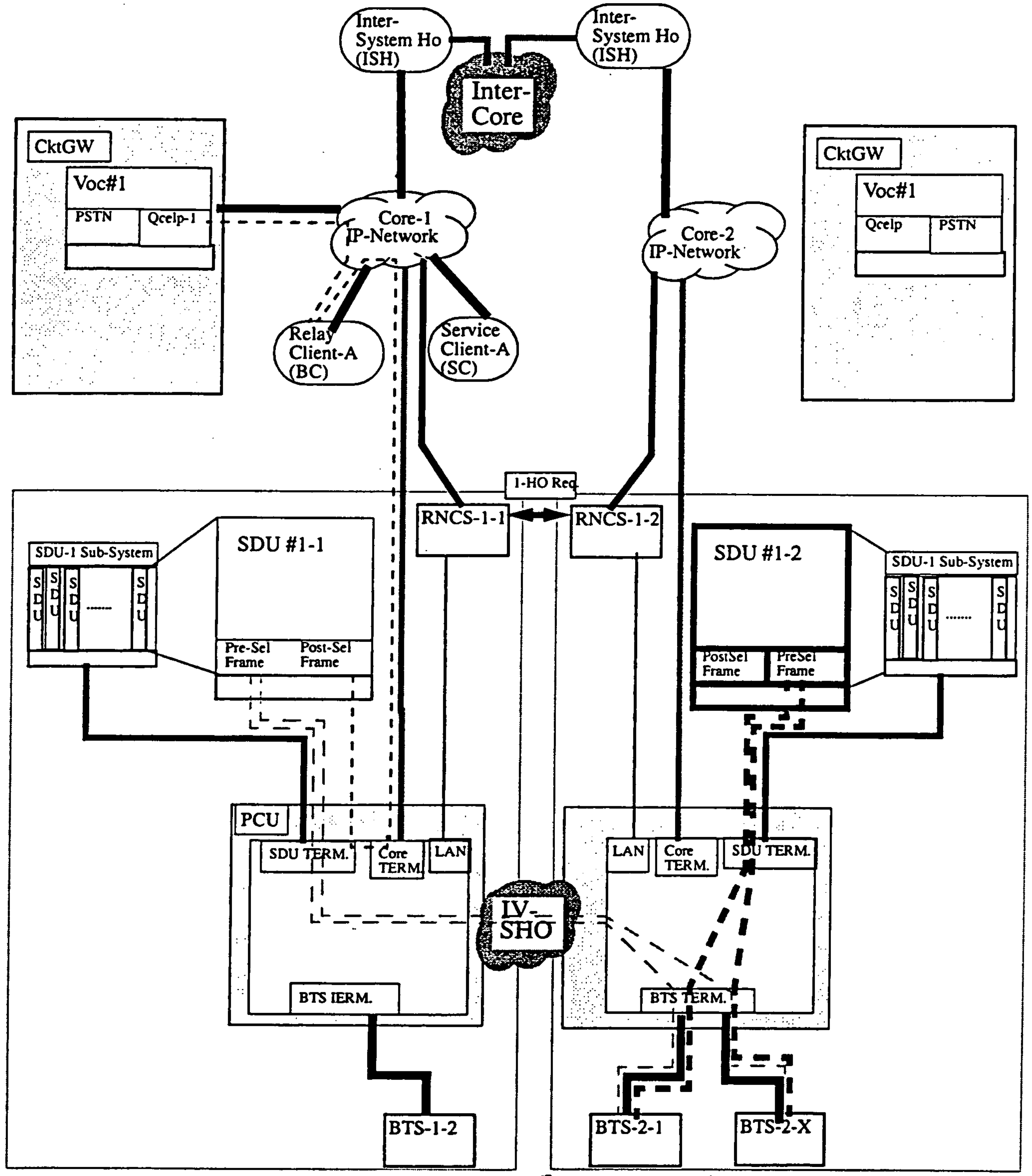
[signature] 5/21/99

[signature] 5/20/99

[signature] 5/20/99

FIGURE 4. Intra-Core Streamline T-1-Establish RAN Connections



Inventor ____ Date 5/20/99 Witness ____ Date 20-May-99

Inventor ____ Date 5/20/99 Witness ____ Date 20 May 99

Inventor ____ Date 5/20/99

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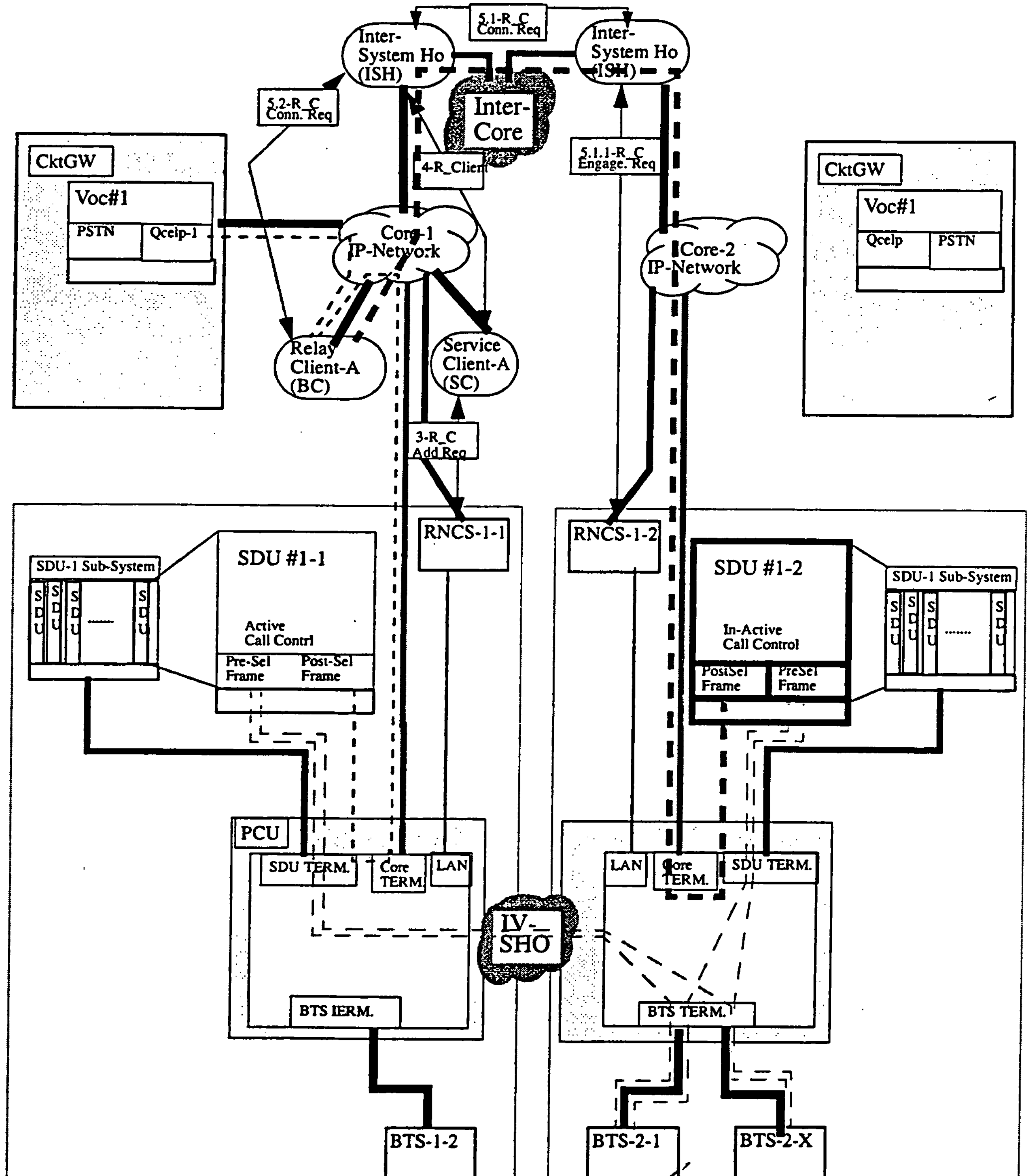
5/20/99

FIGURE 5.

Intra-Core Streamline T=2-Establish Core Connections



Inventor [signature] Date 5/20/99 Witness [signature] Date 20. May-99

Inventor [signature] Date 5/20/99 Witness [signature] Date 20 May 99

Inventor [signature] Date 5/20/99

[signature] 5/20/99

[signature] 5/20/99

[signature] 5/20/99 [signature] 5/21/99

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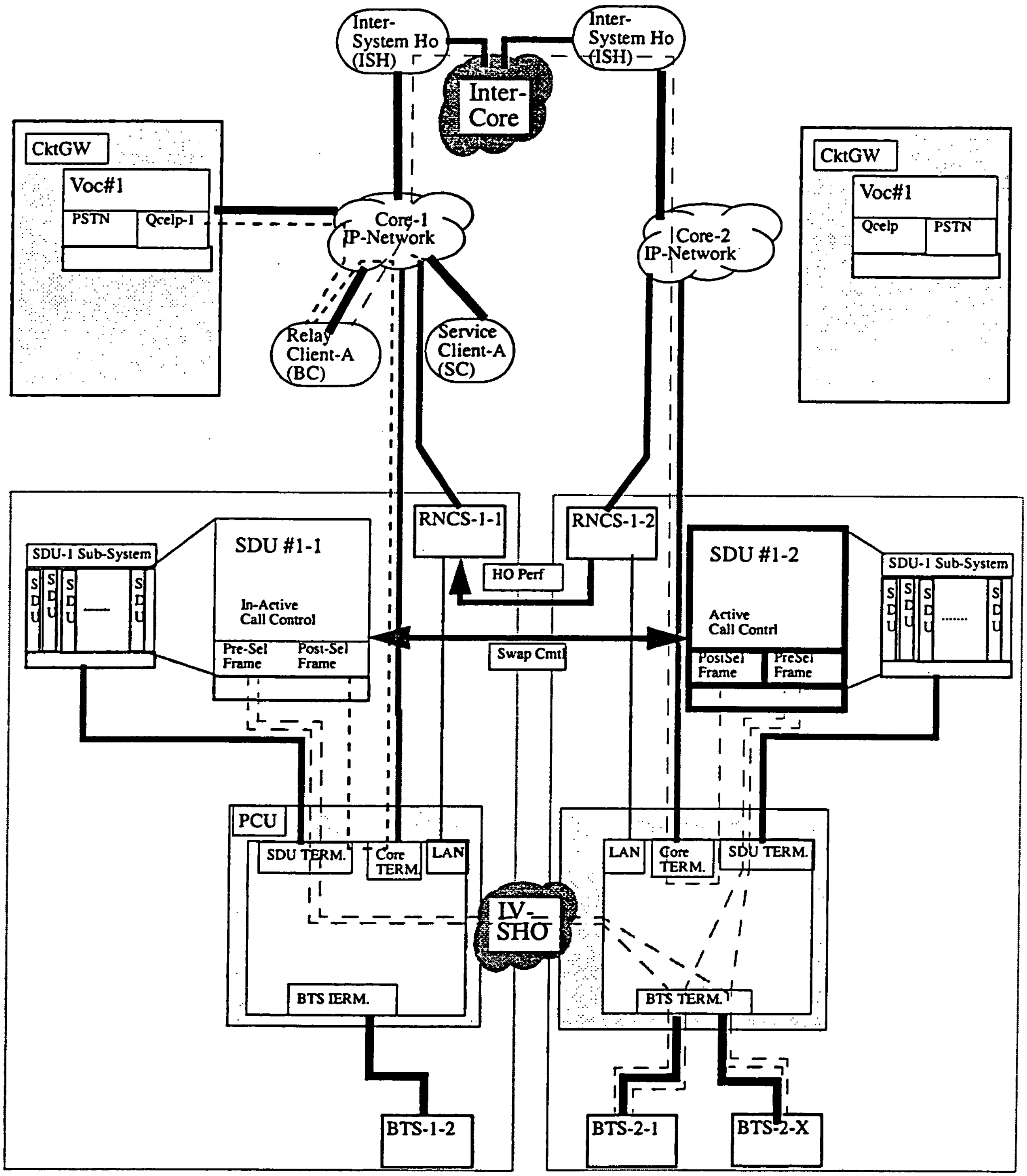
FIGURE 6.

Intra-Core Streamline T=3-Execute Handoffs



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Inventor ______ Date 5/2.1/99 Witness ______ Date 20 May 99

Inventor ______ Date 5/21/99

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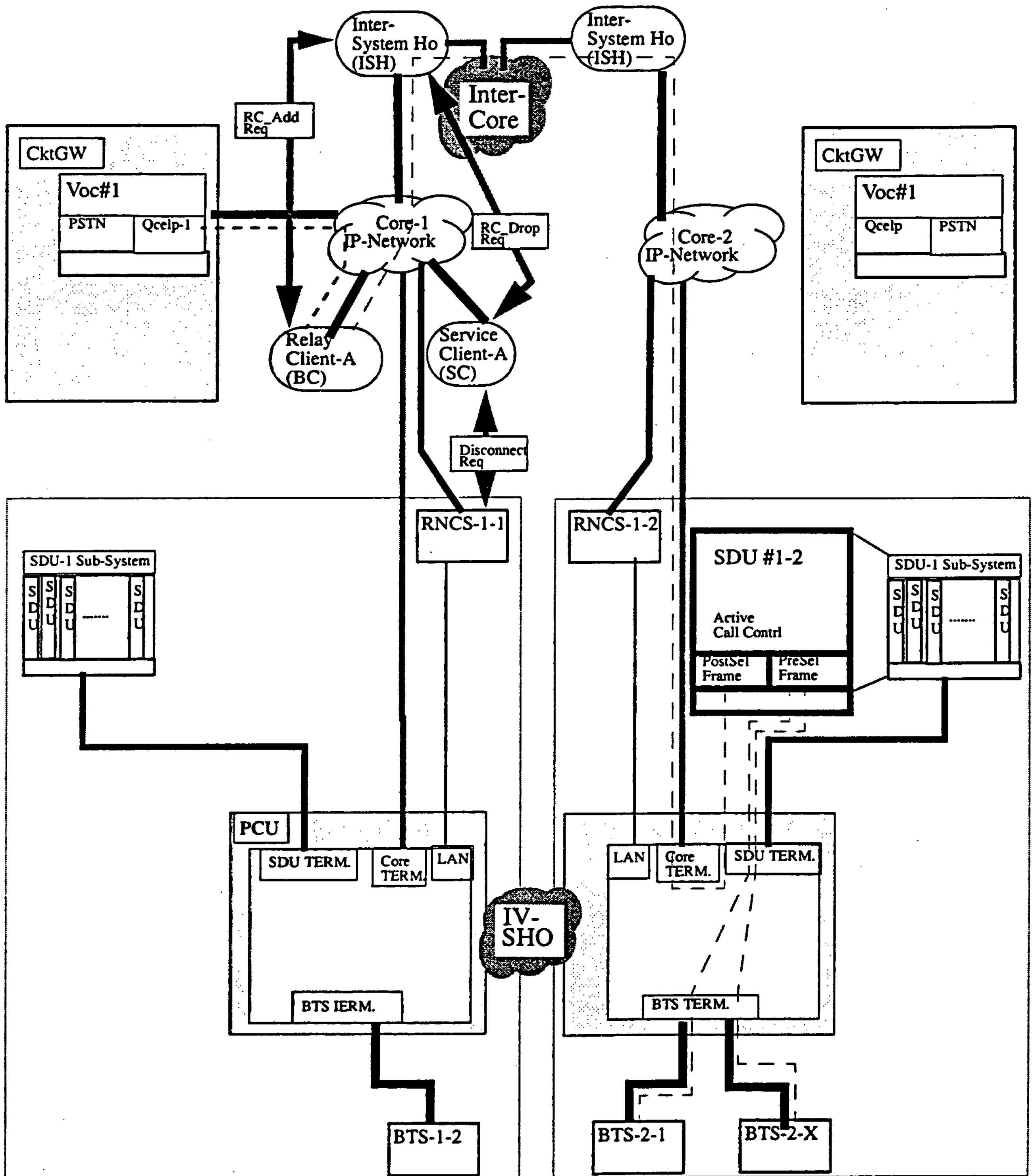
5/20/99 5/21/99

5/20/99

FIGURE 7. Intra-Core Streamline T=4-Tear-Down



Inventor *[signature]* Date 5/20/99 Witness *[signature]* Date 20 MAY-99

Inventor *[signature]* Date 5/12/99 Witness *[signature]* Date 20 May 99

Inventor *[signature]* Date 5/2/99

[signature] 5/20/99

[signature] 5/20/99

[signature] 5/20/99 *[signature]* 5/21/99

4. List the closest known technology (attach article, patent, catalog sheet or other documentation).

Three Party Conference based applications.

Inter-System Soft handoff connectivity disclosures.

5. Improvement(s) over known technology.

Current methods for performing moves to new RAN components are intrusive to the Core and Mobile Station. These are usually performed in a manner where Core and Radio connections must be broken and then re-established. In many cases, the integrity of the new connections is unknown until primary control and bearer traffic is relinquished to the new RAN components. While the original connections remain for procedure failure reasons, the fallback to these connections are typically slow thus degrading the call quality. Through the disclosed method, in particular the introduction of the Core "Y" and RAN "Y" functions, the Core fixed based components and RF connections are unchanged (e.g., No CDMA Hard Handoff) through the movement to new RAN based components. The method allows for an integrity check prior to relinquishing control to the new components thus preserving the call quality through the component handoff.

6. What new elements (e.g. components, circuits, process steps) or combination of known elements or software algorithm produced the improvement?

The invention introduces a set of key functional elements, enabled by the Aerolon network architecture, which used in combination provide for the seamless high integrity handoff of RAN based components.

- Introduction of a Relay Client (Core or RAN based) which serves as the Core "Y" function. Enabling the termination and selection of multiple RAN bearer paths.
- Introduction of a RAN "Y" function which provides the BTS to support multiple bearer and control paths to SDUs (RSCs).
- Selective Connection integrity checks within the Core "Y" and RAN "Y" functions allowing for path integrity validation prior to activation of control and bearer swap.
- SDU to SDU connections via either Core "Y" or RAN "Y" to forward critical dynamic call configuration and state (e.g., RF Layer 2 State, High Speed Data State: PCF, RLP and Bearer Client State) and coordination of the relinquishing of call control and bearer traffic processing.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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SERIAL NO.:	10/043,797	GROUP:	2686
FILED:	JANUARY 11, 2001	CASE NO.:	CE08185R
TITLED:	HIGH INTEGRITY RADIO ACCESS NETWORK CLIENT REALLOCATION IN A WIRELESS COMMUNICATION NETWORK		

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June 29, 2005

Declaration Under 37 CFR §1.131

1. We, Joseph Pedziwiatr, Paul Steinberg, William S. Pierce, Richard James Malcolm, Daniel Francis Tell and Brian Jack Moore, are inventors of the present application and hereby make this declaration.

2. This declaration establishes the completion of the invention in this application in the United States, at a date prior to June 29, 2001 that is the effective date of United States Patent Application Publication No. 2003/0003919 A1 to Beming et al., which was cited by the Examiner.

3. The claimed subject matter of this patent application was the subject of a written disclosure prepared after conception and wherein the written disclosure was submitted as a Disclosure for Patent Committee to the assignee, Motorola, Inc. for the purpose of documenting, considering and maintaining invention disclosures. The Disclosure for Patent Committee is attached as Exhibit A.

4. The conception date of May 21, 1999, which is the earliest verifiable date an individual who is a non-innovator witnessed the claimed subject matter, is prior to June 29, 2001.

5. On or about June 24, 1999, Motorola, Inc. decided to pursue patent protection on the written disclosure previously submitted, and that thereafter, in due course, a patent application was prepared and filed in the United States Patent Office on January 11, 2001.

6. Prior to June 29, 2001 to January 11, 2001, we exercised due diligence to prepare and file the pending patent application. During this time period, we worked toward preparing the pending patent application for filing with the United States Patent and Trademark Office.

7. All of the above statements made of our own knowledge are true and all statement made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of this application or any patent issuing thereon.

Joseph Pedziwiatr	6/30/05
Joseph Pedziwiatr	Date
P. R. Steinberg	6/30/2005
Paul Steinberg	Date
William S. Pierce	Date
Richard James Malcolm	Date
Daniel Francis Tell	Date
Brian Jack Moore	6/30/2005
Brian Jack Moore	Date

#4

MOTOROLA INC.
Cellular Infrastructure Group

Motorola Confidential Proprietary

Inventor(s) will not fill in

Operation

DISCLOSURE NO. CE08185R **DATE** 4/27/99

Patent Committee Action

DISCLOSURE FOR PATENT COMMITTEE

SUBMITTED PURSUANT TO EMPLOYMENT AGREEMENT

FOR INSTRUCTIONS FOR COMPLETION REFER TO DISCLOSURE INSTRUCTION PROCEDURE

Inventor(s) Name(s)
Pedziwiatr, Joseph
Steinberg, Paul
Pierce, Bill
Malcolm, Rich
Tell, Dan
Moore, Quinn
Strawn, John
Spear, Steve

Inventor must fill in items 1 thru 13. Items 2 to 5 may require extra sheets.
BE SURE that all attachments are signed and dated by both the inventor(s) and witnesses.

1. **Name of the invention. (Limit to ten word.)**
Seamless High Integrity Radio Access Client Handoff in a Wireless Network

2. **State the problem(s) solved by the invention.**
See attached.

3. **Describe the invention, including its operation, purpose and environment. (Use separate sheets as required).**
See attached.

4. **List the closest known technology (attach article, patent, catalog sheet or other documentation).**
See attached.

5. **Improvement(s) over known technology.**
See attached.

6. **What new elements (e.g. components, circuits, process steps) or combination of known elements or software algorithm produced the improvement?**
See attached.

7. **What are the potential applications for use of this invention?**
Anyone deploying CDMA systems (Lucent, LG, Samsung, Nortel, etc.)

8. **Conception date?** ____________ **(Attach earliest log sheets, drawings, etc., to support dates).**

9. **To whom did you first disclose this invention? Name:** ____________ **Date:** ____________

10. **Date the device was first built and tested.** ____________
Present location of the device? Not currently implemented.

called Joe

DETERMINATION OF LEGAL INVENTORSHIP WILL BE BY THE PATENT DEPARTMENT.

Inventor's signature (IMPORTANT – YOU MUST USE YOUR FULL NAME) – NO INITIALS

11. **Inventor's Full Name: (Type)** Joseph Pedziwiatr
Signature Joseph Pedziwiatr
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Witness signatures (TWO WITNESSES ARE REQUIRED). Witness must sign and date this form and all attachments.
THE WITNESSES IN SIGNING THIS FORM ATTEST TO THE FACT THAT THEY UNDERSTAND THE INVENTION.

14. Witness Name:(Type) LARRY D. SVEC Signature ________ Date 20 May 99 Phone 847 632 5259

15. Witness Name: (Type) Donald A Wick Signature ________ Date 20 May 99 Phone 847 632 6103

Items 16 thru 24 are to be filled in by the ENGINEERING/PRODUCT MANAGER or above.
THE MANAGER IN SIGNING THIS FORM ATTESTS TO THE FACT THAT HE UNDERSTANDS THE INVENTION.

16. What product will this invention be used in? (No code names -- use brief description if necessary)
Aerolon applications.

17. When (was) (will) the first offer for sale of a product incorporating this invention (be) made?
Date: ____________

18. When is the estimated shipping date?

19. When (was) (will) the first disclosure outside of Motorola (be) made? How and to whom? Nondisclosure agreement signed? State title and date of publication, if any.

20. What is the market for products incorporating this invention? Be specific and quantitative.
GSM/CDMA/UMTS Cellular Systems, GSM/CDMA/UMTS EnterpriseWireless Systems
GSM/CDMA/UMTS Wireless Local Loop Systems

21. Who are the potential competitors? What is the possibility this invention will be used by competitors? Which ones?
Lucent, Samsung, LG, Nortel, Cisco, Ericcson, Nokia

22. Did this invention result from work on a development Contract? (YES) (NO) Contract No.____________
Who was the contracting party?

23. Discuss the business impact that this invention will have on Motorola. Be specific and quantitative.
This invention provides a means to seamlessly move the bearer and control client functions from one Radio Access Network to another. The method uses bridging functions within the Core and RAN networks allowing for simultaneous high integrity connections between the existing a future RAN components through the move operation.

24. Manager's Name (Type) Signature Date Dept. No. Phone

DETERMINATION OF LEGAL INVENTORSHIP WILL BE MADE BY THE PATENT DEPARTMENT.

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Dan Tell	BD996	2-5301	350-42-1127	10039680

Motorola Confidential Proprietary Upon Completion

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Jerry Campbell	BC597	2-2162	510-46-2151

DETERMINATION OF LEGAL INVENTORSHIP WILL BE MADE BY THE PATENT DEPARTMENT.

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11. Inventor's Full Name:	Signature	Date	Social Security No.& Commerce ID
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Inventor's Immediate Supervisor	Dept. No.	Phone	Social Security No .& Commerce ID
Bill Payne	BC279	5-5155	510-46-2151

Motorola Confidential Proprietary Upon Completion

Disclosure for Patent Committee

1. Name of the invention

Seamless High Integrity Radio Access Client Handoff in a Wireless Network

2. State the problem(s) solved by the invention

When a Mobile Termination device accesses the network requesting a desired service, a set of resources and path connections (Control and Bearer) are established within the Core and RAN network to support the requested service. This initial call configuration is assumed to be the optimum call configuration, given the state of the networks at the time of access. But, the dynamics of the RF environment along the mobility of the Mobile Terminating device, this initial call configuration may quickly become sub-optimum.

Functions within the RAN exist to optimize the RF paths. These RF path optimizations result in the establishment or removal of RAN based resources along with their associated control and bearer paths. As the Mobile Terminating device moves throughout the system, the crossing of RAN and CORE boundaries is inevitable. RAN boundary crossings are addressed within the Aerolon network via RAN to RAN interfaces. These interfaces allow Mobile Termination Device services to be provides across the boundaries. In general these interfaces allow for the allocation of BTS and RF resources along with a path for control messaging and bearer traffic delivery. But the support of calls across these interfaces may become sub-optimum over time. The control and bearer traffic paths may be over extended thus introducing unacceptable control latency and bearer traffic delays (including differential delays).

Typically, Radio Access Call Control and Bearer Path Management is centralized at a point within the RAN, referred to in general terms further as the RAN Session Client (RSC). (In particular to CDMA (Wide Band CDMA) the Selector Distribution Unit (SDU) and Radio Network Control Servers (RNCS) are instantiations of an RSC. Critical in maintaining an optimum call configuration is the location of the RSC. The RSC placement is critical, since the RSC serves as the termination point for the Core and BTS Bearer Path along with RAN Call Control. Locating the RSC to minimize bearer traffic delays and control latency is a crucial aspect of an optimum call configuration.

It is therefore beneficial from a Call Quality perspective to transfer the RSC from one physical point to another within the RAN Network.

Moving the physical location of the RSC is currently supported within some networks via intrusive manners. These procedure generally break and re-establish both Core and Radio connections, such as CDMA Hard Handoff. This not only impacts the quality of a given call but requires undesired interaction between the Core Network and MS on RAN boundary limitations. In addition, any modification to the Core and MS connections brings the potential for a failed connection.

Inventor [signature] Date 5/20/99 Witness [signature] Date 20 May 99
Inventor [signature] Date 5-20-99 Witness [signature] Date 20 May 99
Inventor [signature] Date 5/20/99

[signature] 5/21/99
[signature] 5/20/99

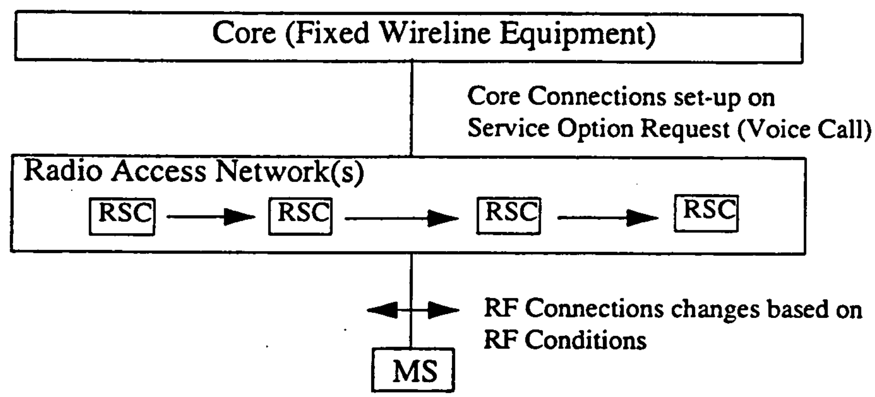
[signature] 5/20/99 [signature] 5/21/99
[signature] 5/20/99

A method needs to be provided which provides a seamless RSC reallocation and which preserves the integrity of the call and connects.

3. Describe the invention, including its operation, purpose and environment.

The following invention specifies a method of moving the RSC within and across RANs in a seamless manner with high integrity. Figure 1, "Seamless RSC Handoff Illustration," on page 2 depicts the objective of this invention. The figure highlights the Fixed Equipment in the Core network and MS's connections unaffected by RSC reallocation within the Radio Access Network(s).

FIGURE 1. Seamless RSC Handoff Illustration



In order provide for a seamless RSC handoff, two parallel paths from the BTS(s) and Core network are created. These connections involve two RSCs with the parallel paths supported via a RANS and Core "Y" bridging function. The "Y" bridging functions serve to provide for un-interrupted Bearer and Control for a given call session through an RSC handoff.

Figure 2, "System Bridging Functionality," on page 3 illustrates a Seamless High Integrity RSC handoff. The execution of such a procedure required the introduction of multiple bridging functions. The first bridging function, identified as the Core "Y" (a.k.a., Relay Client in Aerolon) provides a fixed termination point for fixed core based equipment (e.g., Circuit Gateway). Typically, these paths are formed at initial system access of the MSs. The Core "Y" provides bridging functions between the RSCs during the transitioning process. Further, the bridging function will allow for the integrity of the connection between the Core and new RSC prior to the bearer and control handoff within the RSC.

A RAN "Y" function is also required to shield the MS from the RSC transition. This RAN "Y" function supports the bridging and selection of control and bearer traffic from multiple RSCs. As with the Core "Y" functionality, the bridging function allows for the integrity check of the connections between the new RSC and BTS prior to the bearer and control handoff within the RSC. Typically, the multiple RAN "Y" connections will be established, since multiple BTSs are involved in a given call (CDMA Soft Handoff).

Inventor ______ Date 5/16/99 Witness ______ Date 20-May-99

Inventor ______ Date 5-2-99 Witness ______ Date 20 May 99

Inventor ______ Date 5/20/99

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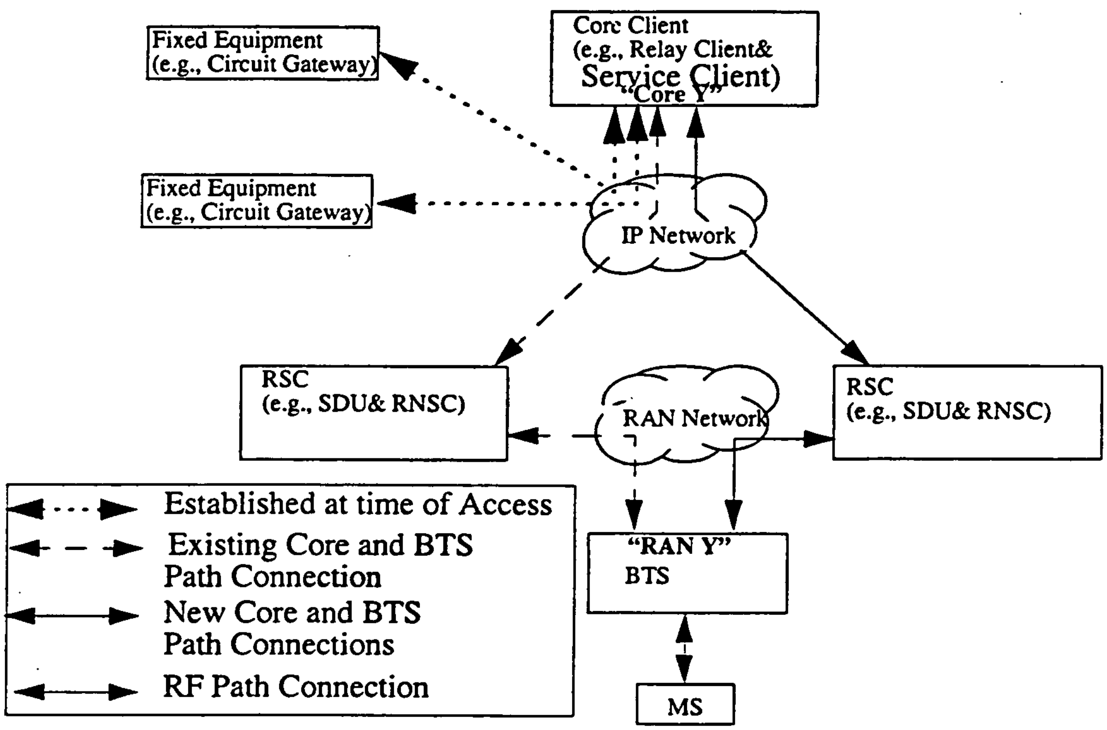
5/20/99

In most cases (e.g., CDMA), handing off of the RSCs involved the preservation of critical data of the Core and MSs. As an example, in a CDMA RSC handoff, the State of the MSs RF Layer 2 State information must be preserved. The relaying of this information between the two RSCs along with the coordination of the handoff would occur via either the Core "Y" or RAN "Y" function.

When all required information is obtained by the new RSC and Core and BTS paths are validated, the new RSC will take-over the control and bearer processing for the call. The old RSC connection will remain providing a graceful fallback in the case of a RSC handoff failure.

FIGURE 2. System Bridging Functionality



The following set of illustrations depict the "Seamless High Integrity Radio Access Client Handoff" in the context of CDMA.

Figure 3, "Intra-Core Streamline T=0," on page 5 illustrates a CDMA Call involved in an Inter-RAN soft handoff. CORE-1 and RAN-1 support the termination of the Core End-Points for a given Voice Call (Note multiple Core end-point may be involved). The Core network supports the Relay Client and the Service Client. Within RAN-1, the RNCS-1-1 supports the call control along with the selection function. The BTSs involved in the call are not contained within RAN-1 but are supported via bearer and control backhaul through the Inter-Vendor Soft Handoff (IV-SHO) inter-connect. At this time, a SDU/RNCS handoff (RSC Handoff) is desired.

Figure 4, "Intra-Core Streamline T=1-Establish RAN Connections," on page 6 illustrates the establishment of the SDU to BTS connection. An SDU is assigned in RAN-2 along with the BTS

Inventor ________ Date 5/20/99 Witness ________ Date 20-May-99

Inventor ________ Date 5-20-99 Witness ________ Date 20 May 99

Inventor ________ Date 5/21/99

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connections to the current serving BTSs. This function requires the RAN "Y" in the BTS. Continuation of the procedure will not occur until the new SDU to BTS(s) path integrity is assured. RAN to RAN control communications are used to initiate and coordinate the new RAN configuration.

Figure 5, "Intra-Core Streamline T=2-Establish Core Connections," on page 7 illustrates the establishment of the Core Network. An interaction will take place between the Core networks to establish a Path to the new SDU. The Relay Client establishes a Core "Y" bridging functions allowing for the new SDU to verify its path connection integrity with the Relay Client. Continuation of the procedure will not occur until the new SDU to Relay Client path integrity is assured. At this time, the Core "Y" and RAN "Y" connections are established and the handing off of control and bearer management can be performed.

Figure 6, "Intra-Core Streamline T=3-Execute Handoffs," on page 8 illustrates the interaction between the RANs to obtain control information. It is expected to minimize latency that the required call data would be exchanged via the bearer path. The used of either the Core "Y" or RAN "Y" provides a channel between the two SDUs for control data exchange. Once the required data is obtained by the new SDU, the new SDU will take control of the call. The old SDU and its associated connections will remain as a fallback configuration.

Figure 7, "Intra-Core Streamline T=4-Tear-Down," on page 9 illustrates the teardown of the initial connections. This would be performed on the successful completion of the SDU handoff.

Inventor ______ Date 5/20/99 Witness ______ Date 20-May-99

Inventor ______ Date 5-20-99 Witness ______ Date 20 May 99

Inventor ______ Date 5/21/99

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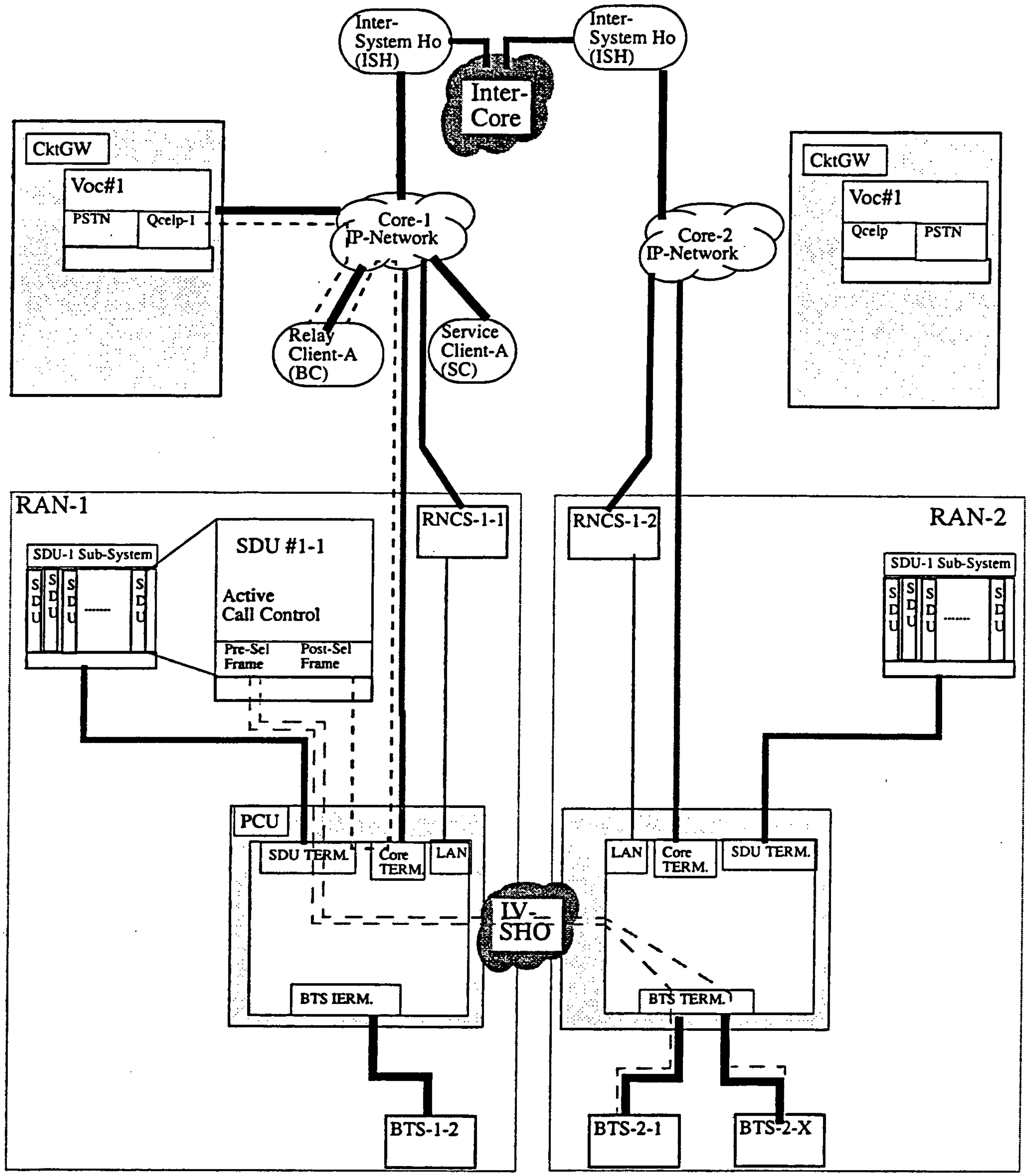
5/20/99 5/21/99

5/20/99

FIGURE 3. Intra-Core Streamline T=0



Inventor [signature] Date 5/20/99 Witness [signature] Date 20-MAY-99

Inventor [signature] Date 5-20-99 Witness [signature] Date 20 May 99

Inventor [signature] Date 5/21/99

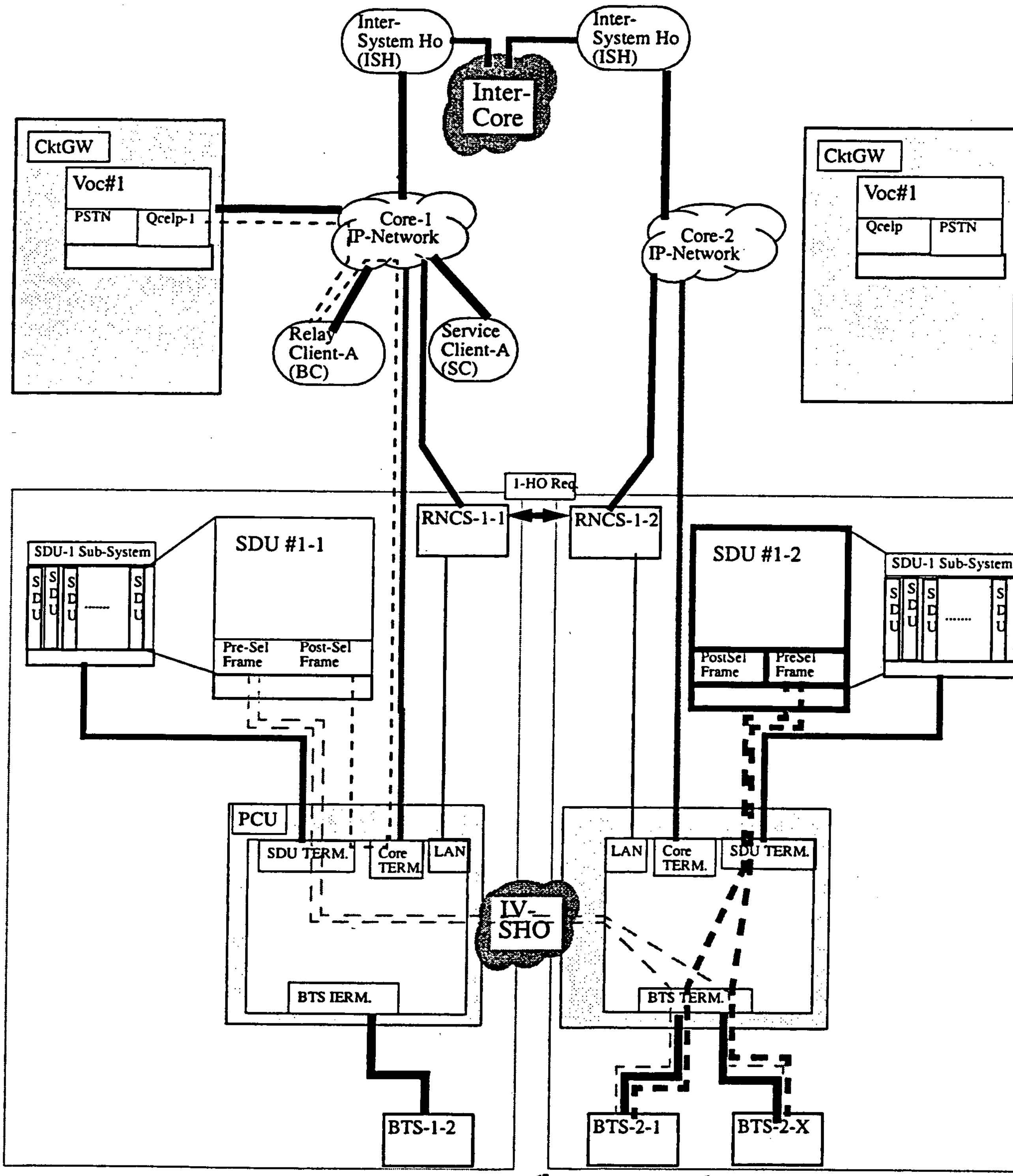
[signature] 5/21/99

[signature] 5/20/99

[signature] 5/20/99 [signature] 5/21/99

[signature] 5/20/99

FIGURE 4. Intra-Core Streamline T=1-Establish RAN Connections



Inventor ____ Date 5/20/99 Witness ____ Date 20-May-99

Inventor ____ Date 5/20/99 Witness ____ Date 20 May 99

Inventor ____ Date 5/20/99

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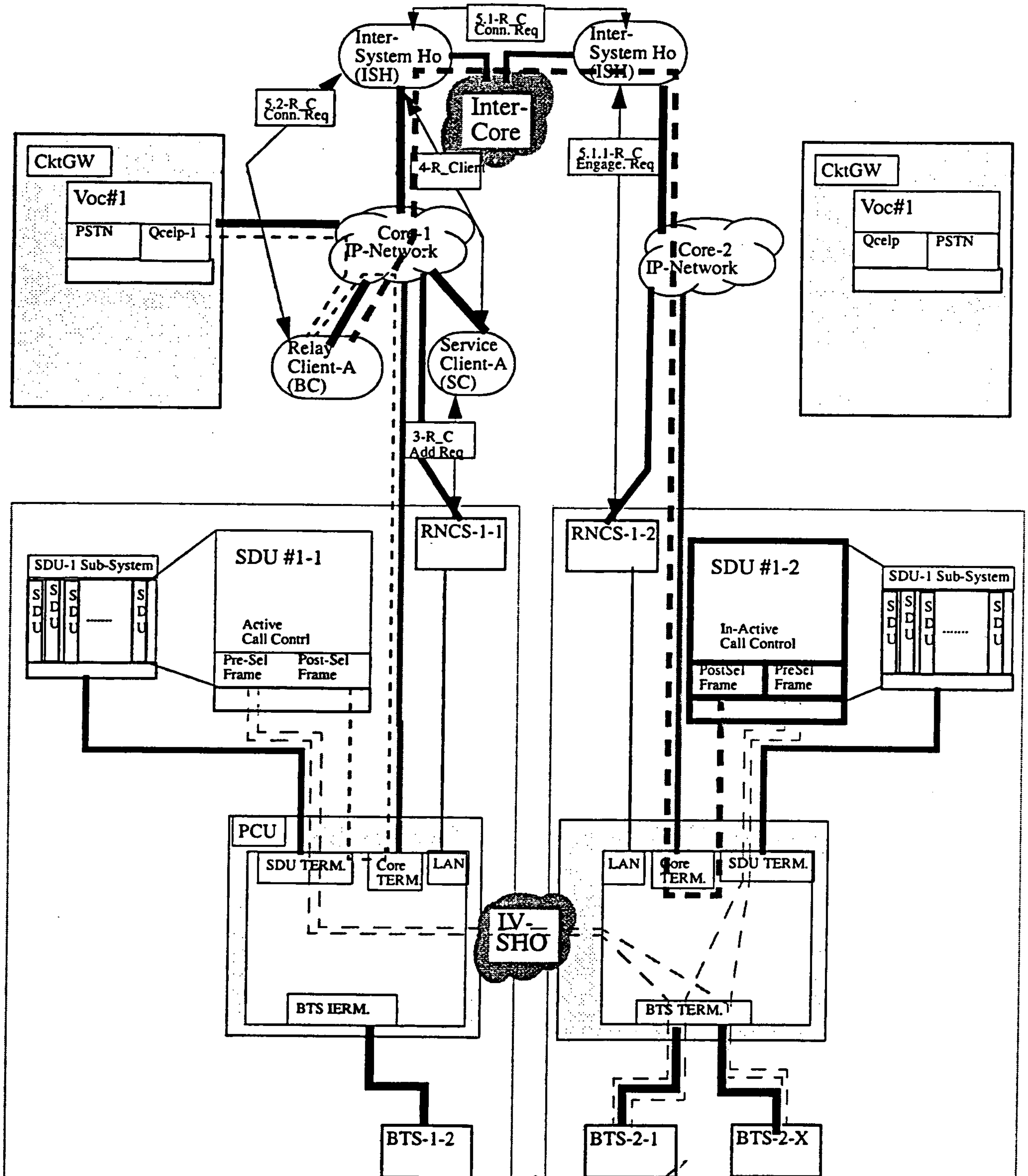
5/20/99 5/21/99

5/20/99

FIGURE 5. Intra-Core Streamline T=2-Establish Core Connections



Inventor [signature] Date 5/20/99 Witness [signature] Date 20. May-99

Inventor [signature] Date 5/20/99 Witness [signature] Date 20 May 99

Inventor [signature] Date 5/20/99

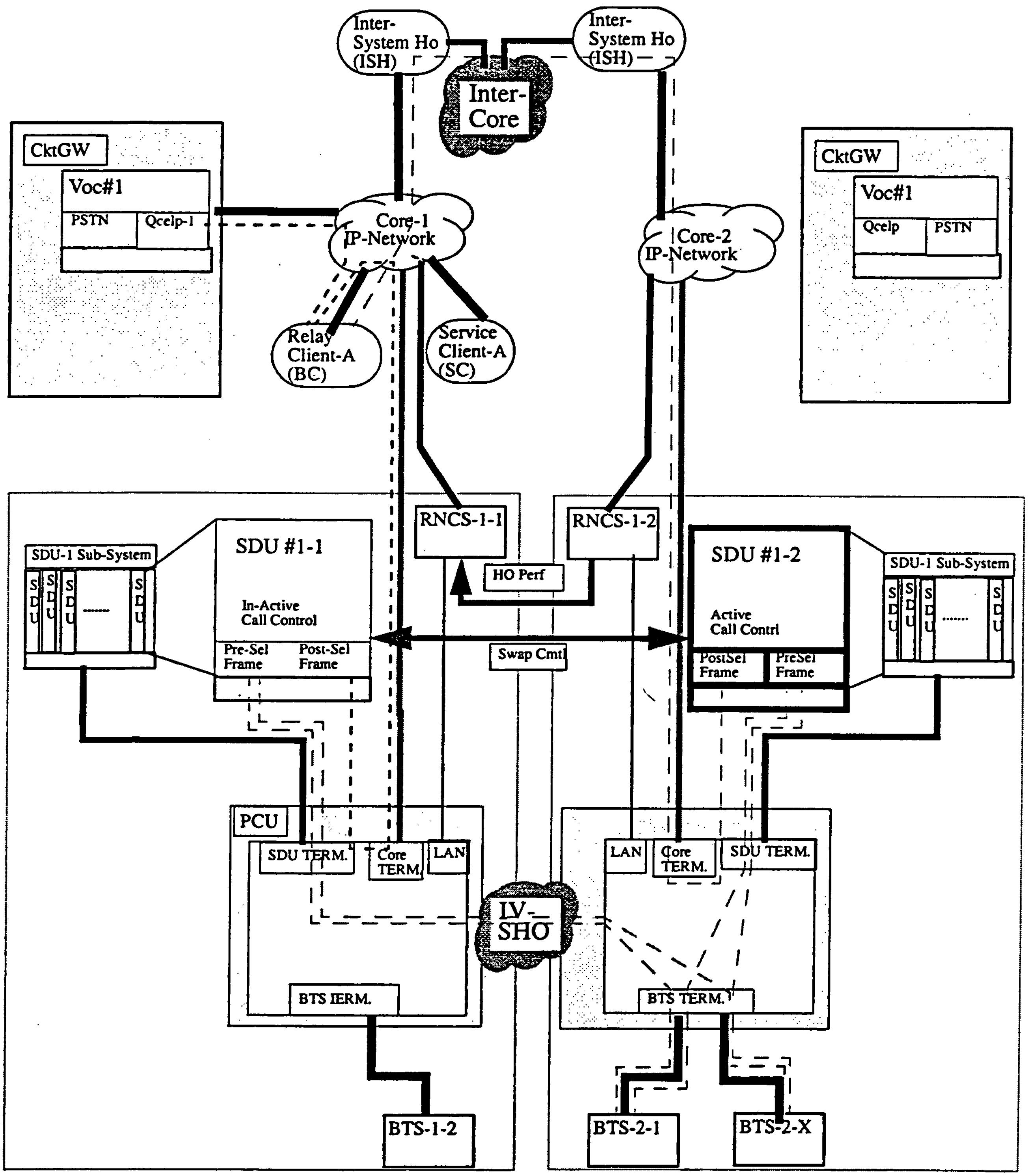
[signature] 5/20/99

[signature] 5/20/99

[signature] 5/20/99 [signature] 5/21/99

[signature]

FIGURE 6. Intra-Core Streamline T=3-Execute Handoffs



Inventor ______ Date 5/21/99 Witness ______ Date 20 May 99

Inventor ______ Date 5/21/99 Witness ______ Date 20 May 99

Inventor ______ Date 5/21/99

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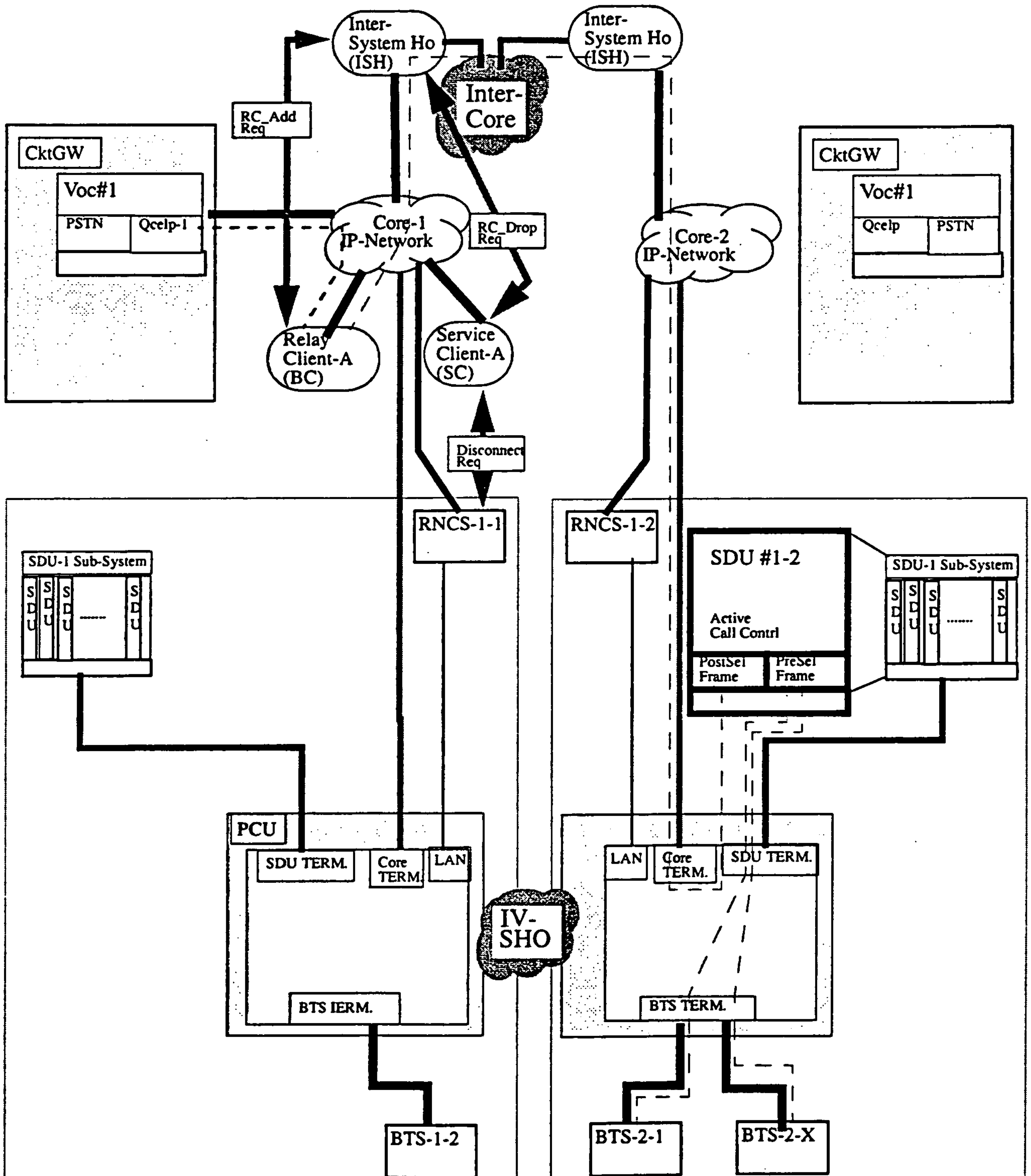
5/20/99 5/21/99

5/20/99

FIGURE 7. Intra-Core Streamline T=4-Tear-Down



Inventor _______ Date 5/20/99 Witness _______ Date 20 MAY 99

Inventor _______ Date 5/20/99 Witness _______ Date 20 May 99

Inventor _______ Date 5/20/99

5/20/99

5/20/99

5/20/99 5/21/99

4. List the closest known technology (attach article, patent, catalog sheet or other documentation).

Three Party Conference based applications.

Inter-System Soft handoff connectivity disclosures.

5. Improvement(s) over known technology.

Current methods for performing moves to new RAN components are intrusive to the Core and Mobile Station. These are usually performed in a manner where Core and Radio connections must be broken and then re-established. In many cases, the integrity of the new connections is unknown until primary control and bearer traffic is relinquished to the new RAN components. While the original connections remain for procedure failure reasons, the fallback to these connections are typically slow thus degrading the call quality. Through the disclosed method, in particular the introduction of the Core "Y" and RAN "Y" functions, the Core fixed based components and RF connections are unchanged (e.g., No CDMA Hard Handoff) through the movement to new RAN based components. The method allows for an integrity check prior to relinquishing control to the new components thus preserving the call quality through the component handoff.

6. What new elements (e.g. components, circuits, process steps) or combination of known elements or software algorithm produced the improvement?

The invention introduces a set of key functional elements, enabled by the Aerolon network architecture, which used in combination provide for the seamless high integrity handoff of RAN based components.

- Introduction of a Relay Client (Core or RAN based) which serves as the Core "Y" function. Enabling the termination and selection of multiple RAN bearer paths.
- Introduction of a RAN "Y" function which provides the BTS to support multiple bearer and control paths to SDUs (RSCs).
- Selective Connection integrity checks within the Core "Y" and RAN "Y" functions allowing for path integrity validation prior to activation of control and bearer swap.
- SDU to SDU connections via either Core "Y" or RAN "Y" to forward critical dynamic call configuration and state (e.g., RF Layer 2 State, High Speed Data State: PCF, RLP and Bearer Client State) and coordination of the relinquishing of call control and bearer traffic processing.

Inventor [illegible] Date 5/20/99 Witness [illegible] Date 20 MAY 99

Inventor [illegible] Date 5/20/99 Witness [illegible] Date 20 May 99

Inventor [illegible] Date 5/21/99

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[illegible] 5/20/99

[illegible] 5/20/99 [illegible] 5/21/99

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	PEDZIWIATR, JOSEPH ET AL.	EXAMINER:	IQBAL, KHAWAR
SERIAL NO.:	10/043,797	GROUP:	2686
FILED:	JANUARY 11, 2001	CASE NO.:	CE08185R
TITLED:	HIGH INTEGRITY RADIO ACCESS NETWORK CLIENT REALLOCATION IN A WIRELESS COMMUNICATION NETWORK		

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Corporate Offices
1303 E. Algonquin Road
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June 30, 2005

Declaration Under 37 CFR §1.131

1. We, Joseph Pedziwiatr, Paul Steinberg, William S. Pierce, Richard James Malcolm, Daniel Francis Tell and Brian Jack Moore, are inventors of the present application and hereby make this declaration.

2. This declaration establishes the completion of the invention in this application in the United States, at a date prior to June 29, 2001 that is the effective date of United States Patent Application Publication No. 2003/0003919 A1 to Beming et al., which was cited by the Examiner.

3. The claimed subject matter of this patent application was the subject of a written disclosure prepared after conception and wherein the written disclosure was submitted as a Disclosure for Patent Committee to the assignee, Motorola, Inc. for the purpose of documenting, considering and maintaining invention disclosures. The Disclosure for Patent Committee is attached as Exhibit A.

4. The conception date of May 21, 1999, which is the earliest verifiable date an individual who is a non-innovator witnessed the claimed subject matter, is prior to June 29, 2001.

5. On or about June 24, 1999, Motorola, Inc. decided to pursue patent protection on the written disclosure previously submitted, and that thereafter, in due course, a patent application was prepared and filed in the United States Patent Office on January 11, 2001.

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7. All of the above statements made of our own knowledge are true and all statement made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of this application or any patent issuing thereon.

Joseph Pedziwiatr	Date
Paul Steinberg	Date
William S. Pierce	Date
Richard James Malcolm	6/30/2005 Date
Daniel Francis Tell	6/30/2005 Date
Brian Jack Moore	Date

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PATENT & TRADEMARK OFFICE

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MOTOROLA INC.
Cellular Infrastructure Group

Motorola Confidential Proprietary

Inventor(s) will not fill in

Operation

DISCLOSURE NO. CE08185R DATE 4/27/99

Patent Committee Action

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DISCLOSURE FOR PATENT COMMITTEE

SUBMITTED PURSUANT TO EMPLOYMENT AGREEMENT

FOR INSTRUCTIONS FOR COMPLETION REFER TO DISCLOSURE INSTRUCTION PROCEDURE

Inventor must fill in items 1 thru 13. Items 2 to 5 may require extra sheets.
BE SURE that all attachments are signed and dated by both the inventor(s) and witnesses.

1. Name of the invention. (Limit to ten word.)
Seamless High Integrity Radio Access Client Handoff in a Wireless Network

2. State the problem(s) solved by the invention.
See attached.

3. Describe the invention, including its operation, purpose and environment. (Use separate sheets as required).
See attached.

4. List the closest known technology (attach article, patent, catalog sheet or other documentation).
See attached.

5. Improvement(s) over known technology.
See attached.

6. What new elements (e.g. components, circuits, process steps) or combination of known elements or software algorithm produced the improvement?
See attached.

7. What are the potential applications for use of this invention?
Anyone deploying CDMA systems (Lucent, LG, Samsung, Nortel, etc.)

8. Conception date? ____________ (Attach earliest log sheets, drawings, etc., to support dates).

9. To whom did you first disclose this invention? Name: ____________ Date: ____________

10. Date the device was first built and tested. ____________
Present location of the device? Not currently implemented.

called Joe.

DETERMINATION OF LEGAL INVENTORSHIP WILL BE BY THE PATENT DEPARTMENT.

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Witness signatures (TWO WITNESSES ARE REQUIRED). Witness must sign and date this form and all attachments.
THE WITNESSES IN SIGNING THIS FORM ATTEST TO THE FACT THAT THEY UNDERSTAND THE INVENTION.

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15. Witness Name: (Type) Donald A Wiik Signature [signature] Date 20 May 99 Phone 847 632 6103

Items 16 thru 24 are to be filled in by the ENGINEERING/PRODUCT MANAGER or above.
THE MANAGER IN SIGNING THIS FORM ATTESTS TO THE FACT THAT HE UNDERSTANDS THE INVENTION.

16. What product will this invention be used in? (No code names – use brief description if necessary)
Aerolon applications.

17. When (was) (will) the first offer for sale of a product incorporating this invention (be) made?
Date: ____________

18. When is the estimated shipping date?

19. When (was) (will) the first disclosure outside of Motorola (be) made? How and to whom? Nondisclosure agreement signed? State title and date of publication, if any.

20. What is the market for products incorporating this invention? Be specific and quantitative.
GSM/CDMA/UMTS Cellular Systems, GSM/CDMA/UMTS EnterpriseWireless Systems
GSM/CDMA/UMTS Wireless Local Loop Systems

21. Who are the potential competitors? What is the possibility this invention will be used by competitors? Which ones?
Lucent, Samsung, LG, Nortel, Cisco, Ericcson, Nokia

22. Did this invention result from work on a development Contract? (YES) (NO) Contract No.____________
Who was the contracting party?

23. Discuss the business impact that this invention will have on Motorola. Be specific and quantitative.
This invention provides a means to seamlessly move the bearer and control client functions from one Radio Access Network to another. The method uses bridging functions within the Core and RAN networks allowing for simultaneous high integrity connections between the existing a future RAN components through the move operation.

24. Manager's Name (Type) Signature Date Dept. No. Phone

DETERMINATION OF LEGAL INVENTORSHIP WILL BE MADE BY THE PATENT DEPARTMENT.

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Page 2--Disclosure No.__________ Motorola Confidential Proprietary Upon Completion

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Page 2--Disclosure No._________ Motorola Confidential Proprietary Upon Completion

Disclosure for Patent Committee

1. Name of the invention

Seamless High Integrity Radio Access Client Handoff in a Wireless Network

2. State the problem(s) solved by the invention

When a Mobile Termination device accesses the network requesting a desired service, a set of resources and path connections (Control and Bearer) are established within the Core and RAN network to support the requested service. This initial call configuration is assumed to be the optimum call configuration, given the state of the networks at the time of access. But, the dynamics of the RF environment along the mobility of the Mobile Terminating device, this initial call configuration may quickly become sub-optimum.

Functions within the RAN exist to optimize the RF paths. These RF path optimizations result in the establishment or removal of RAN based resources along with their associated control and bearer paths. As the Mobile Terminating device moves throughout the system, the crossing of RAN and CORE boundaries is inevitable. RAN boundary crossings are addressed within the Aerolon network via RAN to RAN interfaces. These interfaces allow Mobile Termination Device services to be provides across the boundaries. In general these interfaces allow for the allocation of BTS and RF resources along with a path for control messaging and bearer traffic delivery. But the support of calls across these interfaces may become sub-optimum over time. The control and bearer traffic paths may be over extended thus introducing unacceptable control latency and bearer traffic delays (including differential delays).

Typically, Radio Access Call Control and Bearer Path Management is centralized at a point within the RAN, referred to in general terms further as the RAN Session Client (RSC). (In particular to CDMA (Wide Band CDMA) the Selector Distribution Unit (SDU) and Radio Network Control Servers (RNCS) are instantiations of an RSC. Critical in maintaining an optimum call configuration is the location of the RSC. The RSC placement is critical, since the RSC serves as the termination point for the Core and BTS Bearer Path along with RAN Call Control. Locating the RSC to minimize bearer traffic delays and control latency is a crucial aspect of an optimum call configuration.

It is therefore beneficial from a Call Quality perspective to transfer the RSC from one physical point to another within the RAN Network.

Moving the physical location of the RSC is currently supported within some networks via intrusive manners. These procedure generally break and re-establish both Core and Radio connections, such as CDMA Hard Handoff. This not only impacts the quality of a given call but requires undesired interaction between the Core Network and MS on RAN boundary limitations. In addition, any modification to the Core and MS connections brings the potential for a failed connection.

Inventor ________ Date 5/20/99 Witness ________ Date 20 May 99
Inventor ________ Date 5-20-99 Witness ________ Date 20 May 99
Inventor ________ Date 5/20/99

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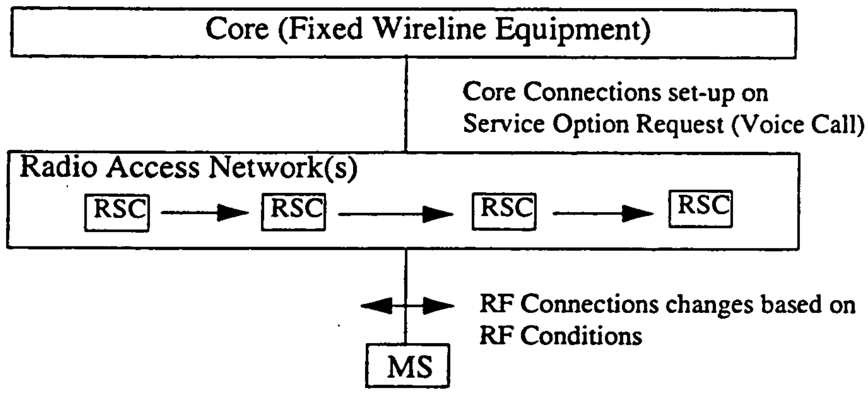
A method needs to be provided which provides a seamless RSC reallocation and which preserves the integrity of the call and connects.

3. Describe the invention, including its operation, purpose and environment.

The following invention specifies a method of moving the RSC within and across RANs in a seamless manner with high integrity. Figure 1, "Seamless RSC Handoff Illustration," on page 2 depicts the objective of this invention. The figure highlights the Fixed Equipment in the Core network and MS's connections unaffected by RSC reallocation within the Radio Access Network(s).

FIGURE 1. Seamless RSC Handoff Illustration



In order provide for a seamless RSC handoff, two parallel paths from the BTS(s) and Core network are created. These connections involve two RSCs with the parallel paths supported via a RANS and Core "Y" bridging function. The "Y" bridging functions serve to provide for un-interrupted Bearer and Control for a given call session through an RSC handoff.

Figure 2, "System Bridging Functionality," on page 3 illustrates a Seamless High Integrity RSC handoff. The execution of such a procedure required the introduction of multiple bridging functions. The first bridging function, identified as the Core "Y" (a.k.a., Relay Client in Aerolon) provides a fixed termination point for fixed core based equipment (e.g., Circuit Gateway). Typically, these paths are formed at initial system access of the MSs. The Core "Y" provides bridging functions between the RSCs during the transitioning process. Further, the bridging function will allow for the integrity of the connection between the Core and new RSC prior to the bearer and control handoff within the RSC.

A RAN "Y" function is also required to shield the MS from the RSC transition. This RAN "Y" function supports the bridging and selection of control and bearer traffic from multiple RSCs. As with the Core "Y" functionality, the bridging function allows for the integrity check of the connections between the new RSC and BTS prior to the bearer and control handoff within the RSC. Typically, the multiple RAN "Y" connections will be established, since multiple BTSs are involved in a given call (CDMA Soft Handoff).

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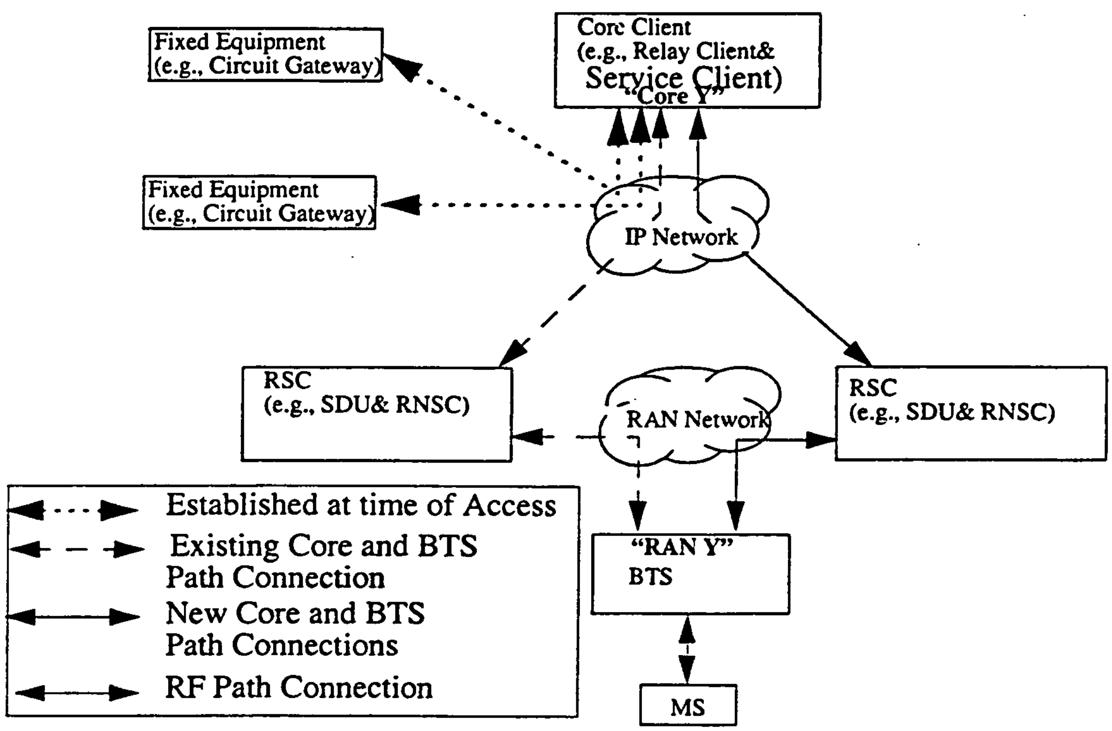
In most cases (e.g., CDMA), handing off of the RSCs involved the preservation of critical data of the Core and MSs. As an example, in a CDMA RSC handoff, the State of the MSs RF Layer 2 State information must be preserved. The relaying of this information between the two RSCs along with the coordination of the handoff would occur via either the Core "Y" or RAN "Y" function.

When all required information is obtained by the new RSC and Core and BTS paths are validated, the new RSC will take-over the control and bearer processing for the call. The old RSC connection will remain providing a graceful fallback in the case of a RSC handoff failure.

FIGURE 2. System Bridging Functionality



The following set of illustrations depict the "Seamless High Integrity Radio Access Client Hand-off" in the context of CDMA.

Figure 3, "Intra-Core Streamline T=0," on page 5 illustrates a CDMA Call involved in an Inter-RAN soft handoff. CORE-1 and RAN-1 support the termination of the Core End-Points for a given Voice Call (Note multiple Core end-point may be involved). The Core network supports the Relay Client and the Service Client. Within RAN-1, the RNCS-1-1 supports the call control along with the selection function. The BTSs involved in the call are not contained within RAN-1 but are supported via bearer and control backhaul through the Inter-Vendor Soft Handoff (IV-SHO) inter-connect. At this time, a SDU/RNCS handoff (RSC Handoff) is desired.

Figure 4, "Intra-Core Streamline T=1-Establish RAN Connections," on page 6 illustrates the establishment of the SDU to BTS connection. An SDU is assigned in RAN-2 along with the BTS

Inventor ______ Date 5/26/99 Witness ______ Date 20-May-99
Inventor ______ Date 5-2-99 Witness ______ Date 20 May 99
Inventor ______ Date 5/21/99
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connections to the current serving BTSs. This function requires the RAN "Y" in the BTS. Continuation of the procedure will not occur until the new SDU to BTS(s) path integrity is assured. RAN to RAN control communications are used to initiate and coordinate the new RAN configuration.

Figure 5, "Intra-Core Streamline T=2-Establish Core Connections," on page 7 illustrates the establishment of the Core Network. An interaction will take place between the Core networks to establish a Path to the new SDU. The Relay Client establishes a Core "Y" bridging functions allowing for the new SDU to verify its path connection integrity with the Relay Client. Continuation of the procedure will not occur until the new SDU to Relay Client path integrity is assured. At this time, the Core "Y" and RAN "Y" connections are established and the handing off of control and bearer management can be performed.

Figure 6, "Intra-Core Streamline T=3-Execute Handoffs," on page 8 illustrates the interaction between the RANs to obtain control information. It is expected to minimize latency that the required call data would be exchanged via the bearer path. The used of either the Core "Y" or RAN "Y" provides a channel between the two SDUs for control data exchange. Once the required data is obtained by the new SDU, the new SDU will take control of the call. The old SDU and its associated connections will remain as a fallback configuration.

Figure 7, "Intra-Core Streamline T=4-Tear-Down," on page 9 illustrates the teardown of the initial connections. This would be performed on the successful completion of the SDU handoff.

Inventor [illegible] Date 5/20/99 Witness [illegible] Date 20-MAY-99

Inventor [illegible] Date 5-20-99 Witness [illegible] Date 20 May 99

Inventor [illegible] Date 5/20/99

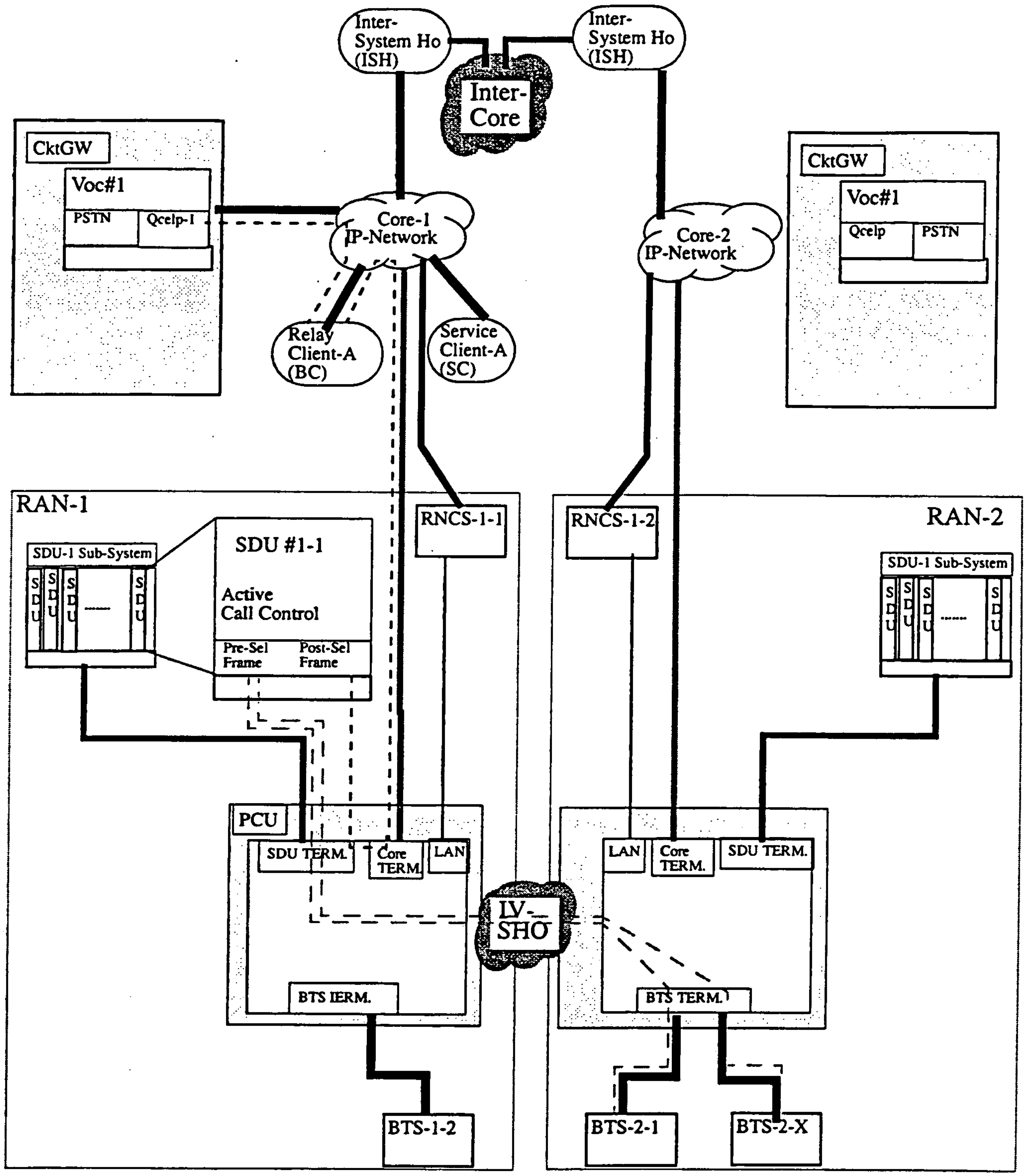
[illegible] 5/21/99

[illegible] 5/20/99

[illegible] 5/20/99 [illegible] 5/21/99

[illegible] 5/20/99

FIGURE 3. Intra-Core Streamline T=0



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Inventor ________ Date 5-20-99 Witness ________ Date 20 May 99

Inventor ________ Date 5/21/99

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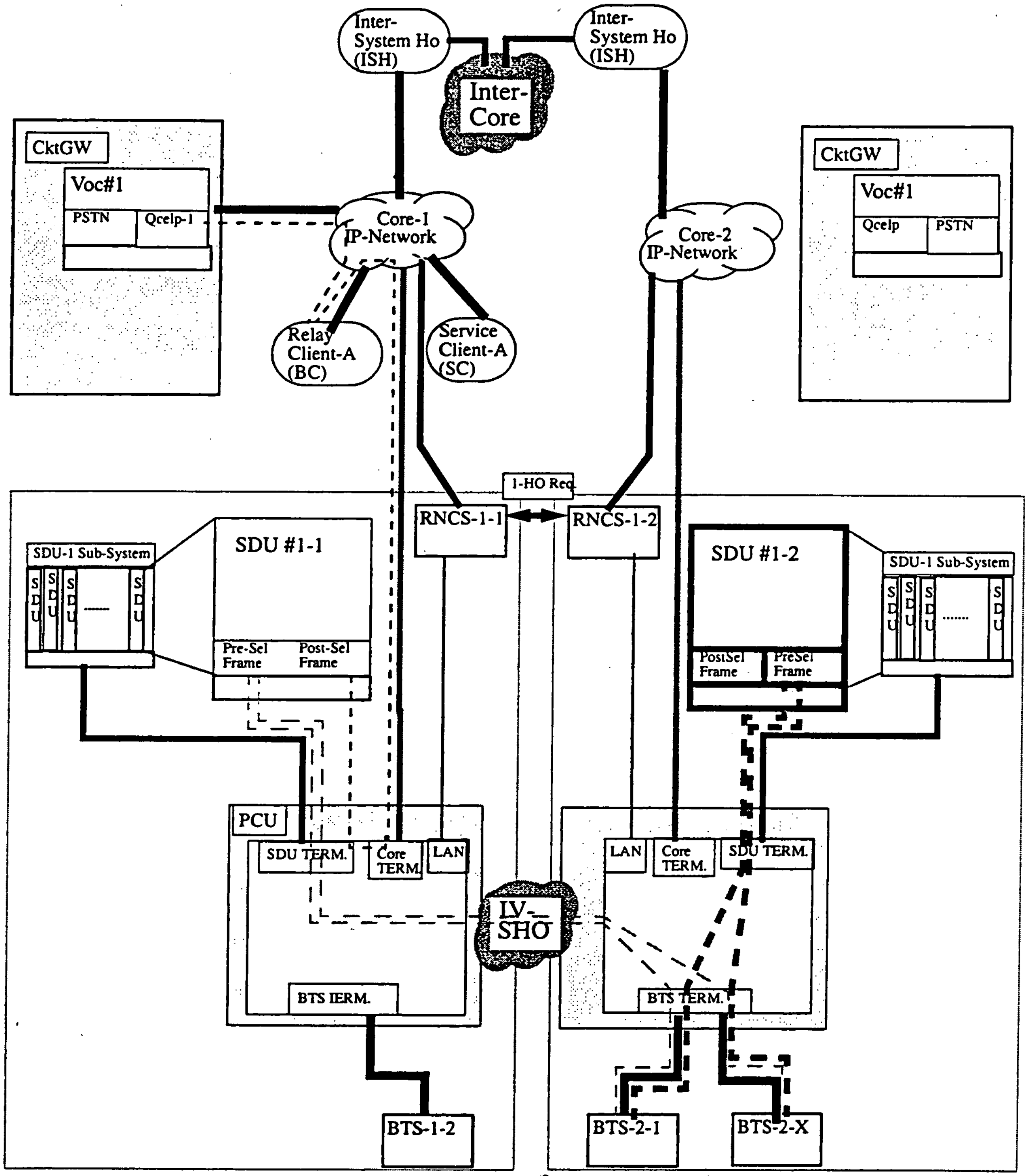
5/21/99

FIGURE 4. Intra-Core Streamline T=1-Establish RAN Connections



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Inventor ________ Date 5/20/99

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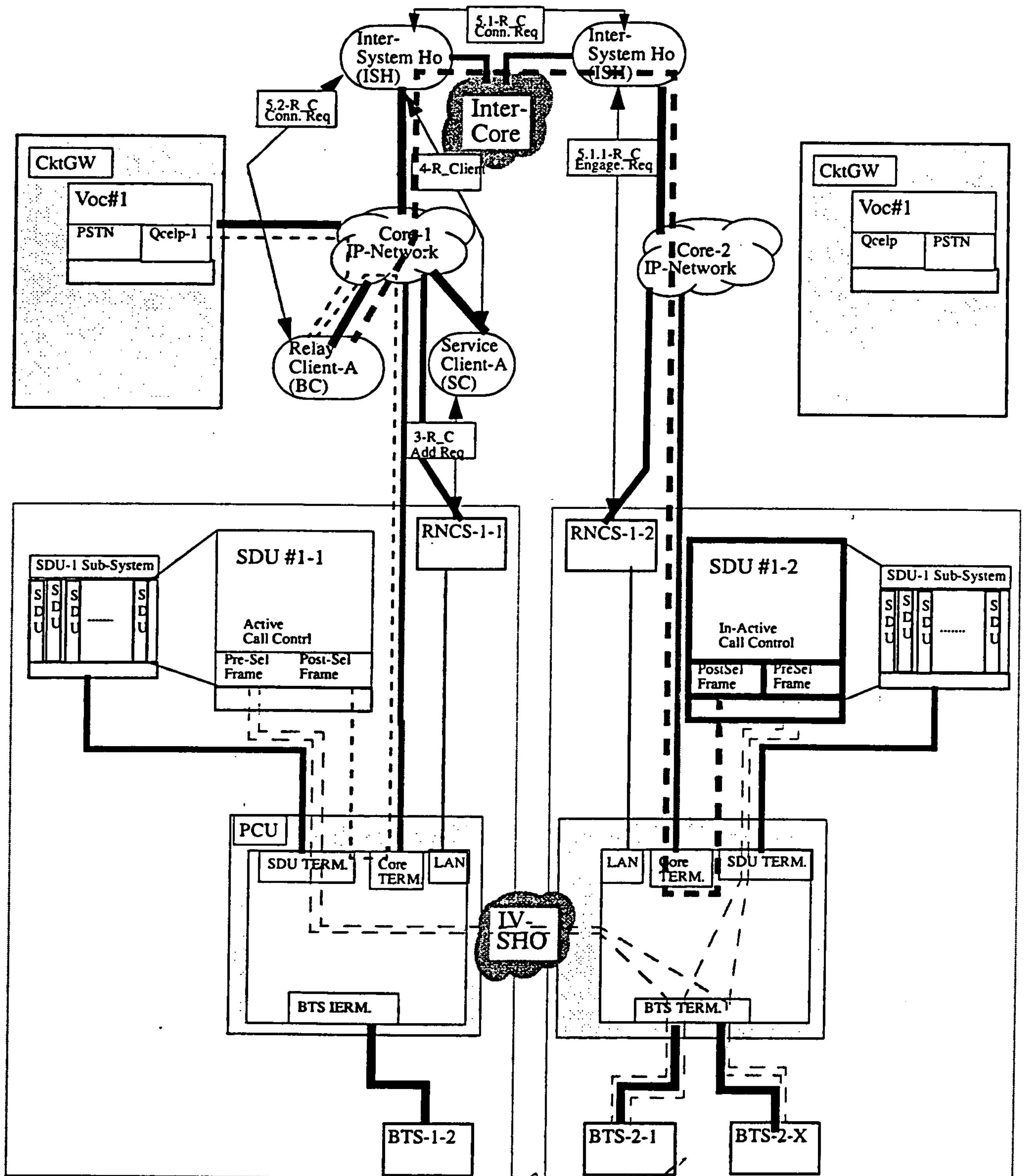
FIGURE 5. Intra-Core Streamline T=2-Establish Core Connections



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Inventor ____ Date 5/20/99 Witness ____ Date 20 May 99

Inventor ____ Date 5/20/99

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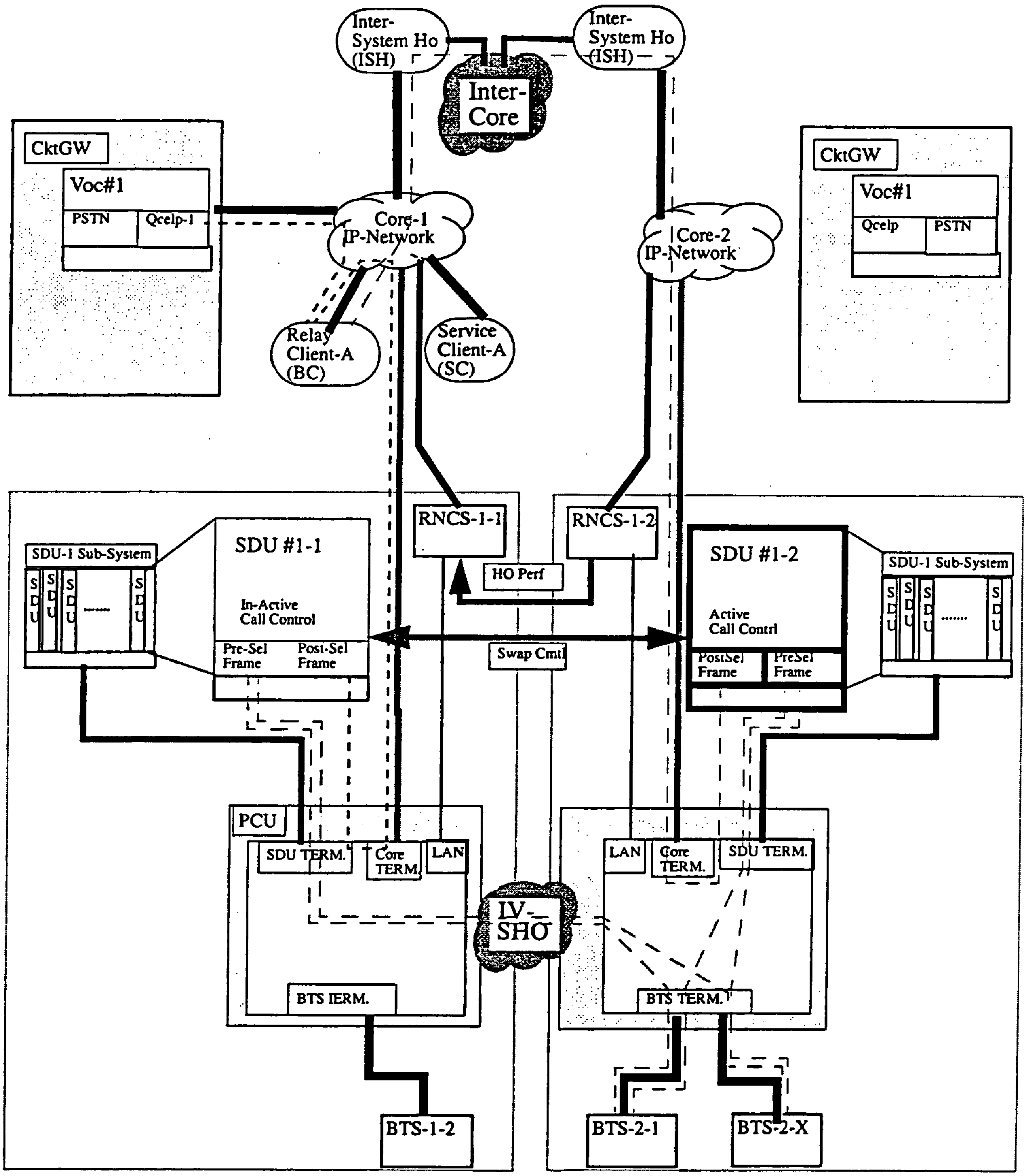
FIGURE 6. Intra-Core Streamline T=3-Execute Handoffs



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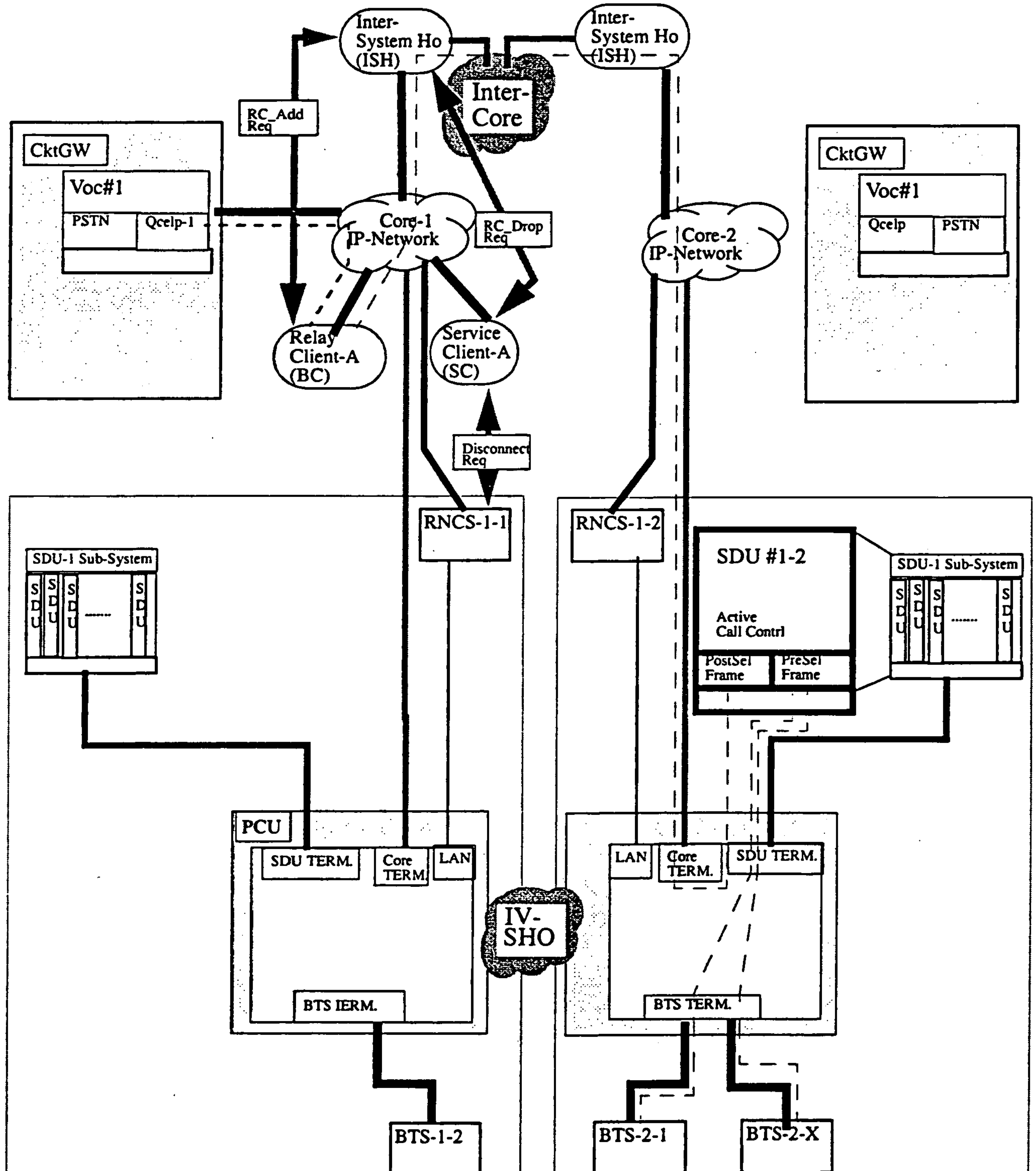
[illegible] 5/20/99

FIGURE 7. Intra-Core Streamline T=4-Tear-Down



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Inventor ________ Date 5/20/99

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4. List the closest known technology (attach article, patent, catalog sheet or other documentation).

Three Party Conference based applications.

Inter-System Soft handoff connectivity disclosures.

5. Improvement(s) over known technology.

Current methods for performing moves to new RAN components are intrusive to the Core and Mobile Station. These are usually performed in a manner where Core and Radio connections must be broken and then re-established. In many cases, the integrity of the new connections is unknown until primary control and bearer traffic is relinquished to the new RAN components. While the original connections remain for procedure failure reasons, the fallback to these connections are typically slow thus degrading the call quality. Through the disclosed method, in particular the introduction of the Core "Y" and RAN "Y" functions, the Core fixed based components and RF connections are unchanged (e.g., No CDMA Hard Handoff) through the movement to new RAN based components. The method allows for an integrity check prior to relinquishing control to the new components thus preserving the call quality through the component handoff.

6. What new elements (e.g. components, circuits, process steps) or combination of known elements or software algorithm produced the improvement?

The invention introduces a set of key functional elements, enabled by the Aerolon network architecture, which used in combination provide for the seamless high integrity handoff of RAN based components.

- Introduction of a Relay Client (Core or RAN based) which serves as the Core "Y" function. Enabling the termination and selection of multiple RAN bearer paths.
- Introduction of a RAN "Y" function which provides the BTS to support multiple bearer and control paths to SDUs (RSCs).
- Selective Connection integrity checks within the Core "Y" and RAN "Y" functions allowing for path integrity validation prior to activation of control and bearer swap.
- SDU to SDU connections via either Core "Y" or RAN "Y" to forward critical dynamic call configuration and state (e.g., RF Layer 2 State, High Speed Data State: PCF, RLP and Bearer Client State) and coordination of the relinquishing of call control and bearer traffic processing.

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